Product Data

50HS Single-Package Heat Pump Units 50 Hz

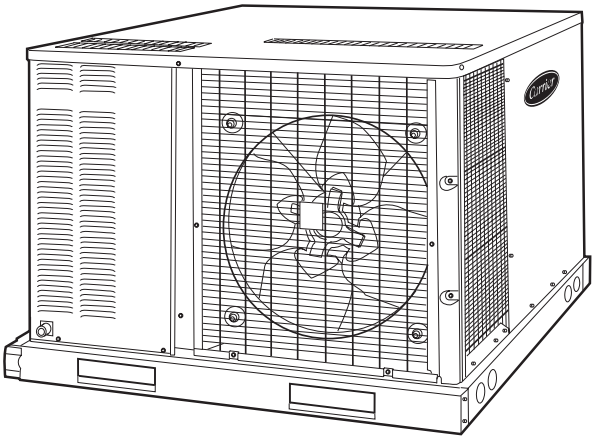
Nominal: 7 to 18 kW
(2 to 5 Tons)

Quality Assurance

Carrier Corporation UL REGISTERED FIRM ISO 9002 #A2325

BSI REGISTERED FIRM — Certificate No FM 22838

Approvals:
ISO 9002
EN 29002
BS5750 PART 2
ANSI/ASQC Q92



Single-Package Heat Pump for Manufactured Housing/Residential and Light Commercial use.

Features/Benefits

One-piece heat pumps with optional electric heaters provide lower installation costs, dependable performance, and easy maintenance

Easy installation

Factory-assembled package is a compact, fully self-contained, heat pump unit that is prewired, prepiped, and precharged for minimum installation expense.

50HS units are available in a variety of standard sizes with voltage options to meet residential and light commercial requirements. Unit is installed easily on a rooftop or a ground-level pad, and is equipped with a standard commercial grade base rail.

Convertible duct configuration on the 50HS is designed for easy use in either downflow or horizontal discharge applications.

Efficient operation

Good operating economy and energy savings are realized through the use of scroll and advanced reciprocating compressors.

Durable, dependable components

Compressors are designed for high efficiency. Each compressor is hermetically sealed against contamination to help promote longer life and dependable operation. Vibration isolation provides quiet operation. Compressors have internal high-pressure,

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overtemperature, and overcurrent protection. Scroll compressors are found on the 048 and 060 sizes.

Direct-drive, multispeed, PSC (permanent split capacitor) blower motor is standard on all models.

Direct-drive, PSC outdoor-fan motors are designed to help reduce energy consumption and provide for cooling operation down to 4.4 C (40 F).

Refrigerant system is designed to provide dependability. Liquid refrigerant strainers are used to promote clean, unrestricted operation. Each unit leaves the factory with a full refrigerant charge. Refrigerant service connections make checking operating pressures easier. Each system is also equipped with a loss of charge switch.

A fixed metering device (Acutrol™) controls refrigerant flow precisely.

Protection devices include a suction line accumulator that keeps liquid refrigerant from reaching the compressor and a crankcase heater to keep compressor oil warm for optimum lubrication. (This equipment is not required or included on units using scroll compressors.)

Solid-state Time Guard® circuit protects the compressor by preventing potentially damaging too-rapid cycling.

Indoor and outdoor coils are computer-designed for optimum heat transfer and cooling efficiency. Outdoor coil is fabricated of copper tube and aluminum fins and is located inside the unit to protect against damage and ensure long life and reliable operation.

Copper fin coils are also available by special order. These coils are recommended in applications where aluminum fins are likely to be destroyed due to corrosion. They are ideal for seacoast applications.

Chronotemp™ defrost system provides time/temperature-based defrost cycles to maintain unit efficiency. This highly reliable system checks for coil icing conditions at preset time intervals and initiates a defrost cycle only if required. The defrost cycle ends as soon as defrosting is accomplished.

Weatherized cabinets are constructed of heavy-duty, phosphated, zinc-coated, prepainted steel capable of withstanding 500 hours in salt spray. Interior surfaces of the indoor compartment are insulated with foil-faced, cleanable insulation to help keep the conditioned air from being affected by the outdoor ambient temperature and to provide improved air quality. Unit insulation conforms to American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) No. 62P. Sloped, non-corrosive drain pan ensures complete condensate drainage.

Low sound ratings ensure a quiet indoor and outdoor environment with sound ratings as low as 7.8 bels.

Easy-to-service cabinets provide easy accessibility to serviceable components during installation and maintenance. Rounded corners are an important safety feature. A high-quality finish ensures an attractive appearance.

Round duct connections provide easy installation for manufactured housing.

Compact size enables the unit to be located where space is limited.

Downflow-only option is shipped from factory configured for vertical ductwork connection and requires no conversion.

Standard, commercial grade base rail provides holes for rigging and handling as well as an elevated mounting frame that gives structural support to horizontal installations.

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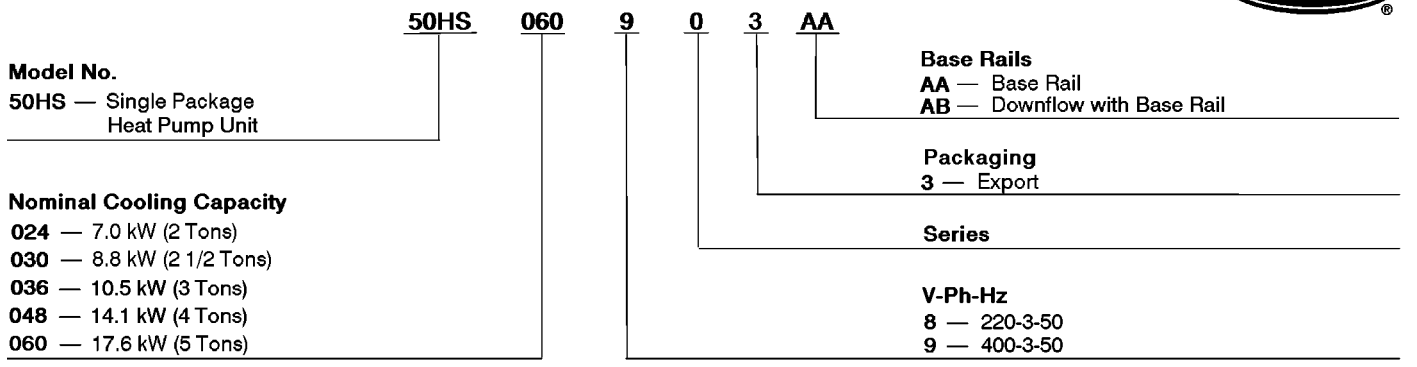
Model number nomenclature


50HS 060 9 0 3 AA
Model No.
50HS — Single Package Heat Pump Unit
Nominal Cooling Capacity
024 — 7.0 kW (2 Tons)
030 — 8.8 kW (2 1/2 Tons)
036 — 10.5 kW (3 Tons)
048 — 14.1 kW (4 Tons)
060 — 17.6 kW (5 Tons)
Base Rails
AA — Base Rail
AB — Downflow with Base Rail
Packaging
3 — Export
Series
V-Ph-Hz
8 — 220-3-50
9 — 400-3-50

Ratings summary

UNIT 50HS	AIRFLOW		COOLING			HEATING Hi Temp			HEATING Lo Temp			SOUND RATING (Bels)
	L/s	Cfm	kW	Btuh	EER	kW	Btuh	COP	kW	Btuh	COP	
024	378	800	7.15	24,400	8.3	6.8	23,200	2.9	3.3	11,400	1.6	7.8
030	472	1000	8.50	29,000	8.2	8.2	27,600	3.0	3.9	13,400	1.7	7.8
036	566	1200	10.20	34,800	8.4	10.1	34,400	3.0	5.0	17,000	1.8	8.0
048	755	1600	13.60	46,600	8.4	14.6	49,800	3.2	8.2	28,000	2.0	8.2
060	941	1995	17.10	58,500	8.1	17.4	59,500	3.1	10.2	34,800	2.1	8.2

LEGEND

Bels — 10 Decibel Unit (1 bel = 10 decibels)
COP — Coefficient of Performance
EER — Energy Efficiency Ratio
db — Dry Bulb
wb — Wet Bulb

NOTE: Ratings are net values, reflecting the effects of circulating fan heat. Cooling ratings are based on 27 C (80 F) db, 19 C (67 F) wb indoor entering-air temperature and 35 C (95 F) db entering-air outdoor temperature. Heating (Hi Temp) ratings are based on 21.1 C (70 F) db, 8.3 C (47 F) wb indoor entering-air temperature, and 6.1 C (43 F) db entering-air outdoor temperature. Heating (Lo Temp) ratings are based on 21.1 C (70 F) db, −8.3 C (17 F) wb indoor entering-air temperature, and −9.4 C (15 F) db entering-air outdoor temperature.

OUTDOOR SOUND: ONE-THIRD OCTAVE BAND DATA — DECIBELS

FREQUENCY (Hz)	UNIT 50HS				
	024	030	036	048	060
63	46.0	47.9	47.7	49.4	52.7
125	60.6	58.1	68.0	63.9	66.2
250	70.3	69.9	70.7	71.5	74.7
500	70.7	70.4	71.3	74.7	74.9
1000	72.5	71.1	72.1	78.7	78.8
2000	70.9	69.8	70.3	76.5	75.7
4000	68.0	68.1	68.9	71.3	69.8
8000	60.5	61.6	63.2	63.3	61.2

Physical data

SI

UNIT 50HS	024	030	036	048	060
REFRIGERANT	R-22				
Refrigerant Control*	Acutrol™ System				
OPERATING WEIGHT (Kg)	128	136	147	165	168
COMPRESSOR, TYPE	Reciprocating	Reciprocating	Reciprocating	Scroll	Scroll
INDOOR BLOWER	Centrifugal — Direct Drive				
Speeds	2	2	2	2	2
R/s (High/Low Speed)	15.4/13.3	15.4/13.3	15.4/13.3	15.8/15.4	15.8/15.4
Diameter (mm)	254	254	254	254	254
Width (mm)	229	229	229	229	229
Nominal Airflow (L/s)	378	472	566	755	941
Motor (Watts)	373	373	373	559	559
INDOOR COIL					
Rows...Fins/mm	3...0.59	3...0.59	3...0.59	4...0.59	4...0.59
Face Area (sq m)	.21	0.28	0.25	0.41	0.41
OUTDOOR FAN	Propeller — Direct Drive				
L/s	802	896	896	1133	1133
R/s	16.7	18.3	18.3	17.9	17.9
Diameter (mm)	457	457	457	508	508
Motor (Watts)	186	186	186	248	248
OUTDOOR COIL					
Rows...Fins/mm	1.6...0.67	2...0.67	2...0.67	2...0.67	2...0.67
Face Area (sq m)	0.54	0.54	0.64	0.78	0.78
FILTER SIZE (mm)†					
Throwaway	508 x 508	508 x 610	610 x 610	610 x 762	610 x 762

*Operating charge listed on unit nameplate.
†Recommended field-supplied filters are 25 mm thick.

ENGLISH

UNIT 50HS	024	030	036	048	060
REFRIGERANT	R-22				
Refrigerant Control*	Acutrol System				
OPERATING WEIGHT (lb)	281	300	324	363	370
COMPRESSOR, TYPE	Reciprocating	Reciprocating	Reciprocating	Scroll	Scroll
INDOOR BLOWER	Centrifugal — Direct Drive				
Speeds	2	2	2	2	2
Rpm (High/Low Speed)	925/800	925/800	925/800	950/925	950/925
Diameter (in.)	10	10	10	10	10
Width (in.)	9	9	9	9	9
Nominal Airflow (Cfm)	800	1000	1200	1600	1995
Motor Hp	½	½	½	¾	¾
INDOOR COIL					
Rows...Fins/in.	3...15	3...15	3...15	4...15	4...15
Face Area (sq ft)	2.29	3.06	2.71	4.44	4.44
OUTDOOR FAN	Propeller — Direct Drive				
Cfm	1700	1900	1900	2400	2400
Rpm	1000	1100	1100	1075	1075
Diameter (in.)	18	18	18	20	20
Motor Hp	¼	¼	¼	⅓	⅓
OUTDOOR COIL					
Rows...Fins/in.	1.6...17	2...17	2...17	2...17	2...17
Face Area (sq ft)	5.80	5.80	6.86	8.44	8.44
FILTER SIZE (in.)†					
Throwaway	20 x 20	20 x 24	24 x 24	24 x 30	24 x 30

*Operating charge listed on unit nameplate.
†Recommended field-supplied filters are 1 in. thick.

Options and accessories

Options

Downflow option provides for easy vertical ductwork connections.

Accessories

ACCESSORY	
Roof Curb	0.203 m (8 in.)
	0.279 m (11 in.)
	0.356 m (14 in.)
30% Open Manual Outdoor-Air Damper	
One-in. Filter Rack	
Duct Cover Kit	
Rectangular Duct Connection Kit	
Outdoor Thermostat	
Thermostat and Subbase	
Electronic Programmable Thermostat	
Controls Upgrade Kit	
Low-Ambient Kit	
Electric Heat with Single-Point Kit (6.9 to 14.7 kW)	

Factory-assembled roof curbs are designed for use on downflow discharge applications. Heavy gage, galvanized steel construction provides one-piece support. The curb complies with the standards of the NRCA (National Roofing Contractors Association [U.S.A. standard]). A wood nailing strip is provided for attaching the roofing to the curb.

30% open manual outdoor-air damper provides for minimum outdoor air and is manually adjustable.

Thermostat and subbase provide heating and cooling unit control. The subbase provides system and fan switching at the thermostat location.

Electronic programmable thermostat provides 2-stage heating and 2-stage cooling control with remote communication ability.

Low-ambient kit (Motormaster® II device) allows the use of mechanical cooling down to outdoor ambient temperatures as low as −18 C (0° F).

Electric heaters provide heat in the unit when required. Each package has a heater module that slides into keyed mounting slots in the fan inlet. Heater sizes range from 6.9 to 14.7 kW. An available single-point power supply for the entire unit results in lower installed costs.

Controls upgrade kit contains high- and low-pressure switches that provide additional safety features and protect the unit from running at unsuitable pressures.

One-in. filter rack features easy installation, serviceability, and high filtering performance.

Duct cover kit covers horizontal ducts after unit has been converted to downflow discharge. Kit is not required with the downflow option.

Rectangular duct connection kit allows easy conversion from round to rectangular ducts.

Outdoor thermostat allows for staging of electric heaters based on outdoor-air temperatures.

Dimensions

SIZES 024-036

UNIT	ELECTRICAL CHARACTERISTICS	UNIT WT		CORNER WT (Lb/Kg)				UNIT HEIGHT (in./mm)	DIMENSION (in./mm)
		Lb	Kg	A	B	C	D	E	F
50HS024	220-3-50, 400-3-50	281	128	64/29	69/31	96/44	52/24	27.4/697	21.5/546
50HS030	220-3-50, 400-3-50	300	136	78/35	78/35	116/53	43/20	27.4/697	21.5/546
50HS036	220-3-50, 400-3-50	324	147	63/29	93/42	100/45	68/31	31.4/798	25.5/648

UNIT	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
50HS024	21.4/544	20.5/522	11.9/304
50HS030	20.8/553	20.4/518	11.9/304
50HS036	21.7/552	20.9/531	13.5/344

REQ'D CLEARANCES FOR SERVICING — in. (mm)
Indoor Coil Access Side 30 (762)
Control Box Access Side 30 (762)
(Except for NEC requirements)
Unit Top 36 (914)
Side Opposite Ducts 30 (762)

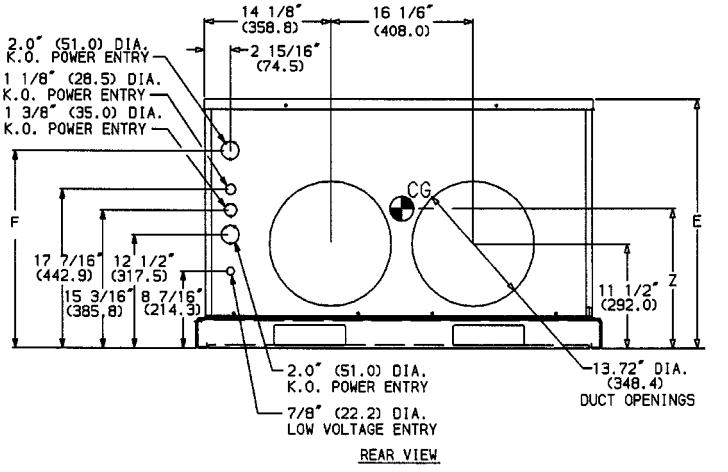
REQ'D CLEARANCES TO COMBUSTIBLE MAT'L — in. (mm)
Unit Top 0
Duct Side of Unit 0
Side Opposite Ducts 0
Bottom of Unit 0
Vertical Discharge, First 12 in. (305) of Supply Duct 1 (25)

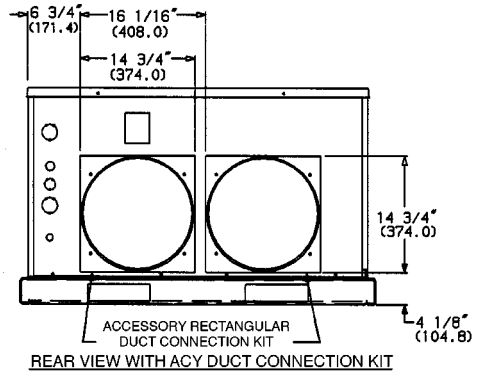
NEC REQ'D CLEARANCES — in. (mm)
Between Units, Control Box Side 42 (1067)
Unit and Ungrounded Surfaces, Control Box Side 36 (914)
Unit and Block or Concrete Walls and Other
Grounded Surfaces, Control Box Side 42 (1067)

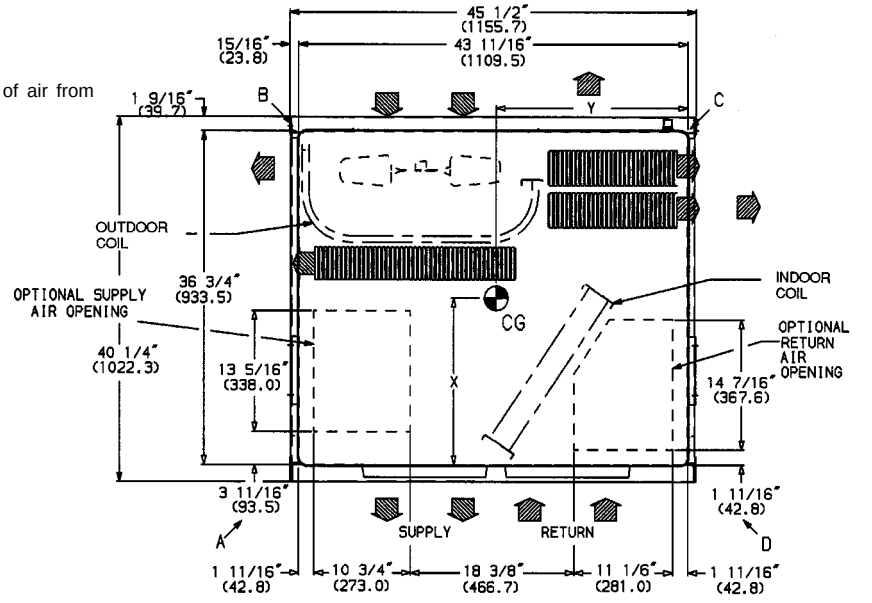
LEGEND

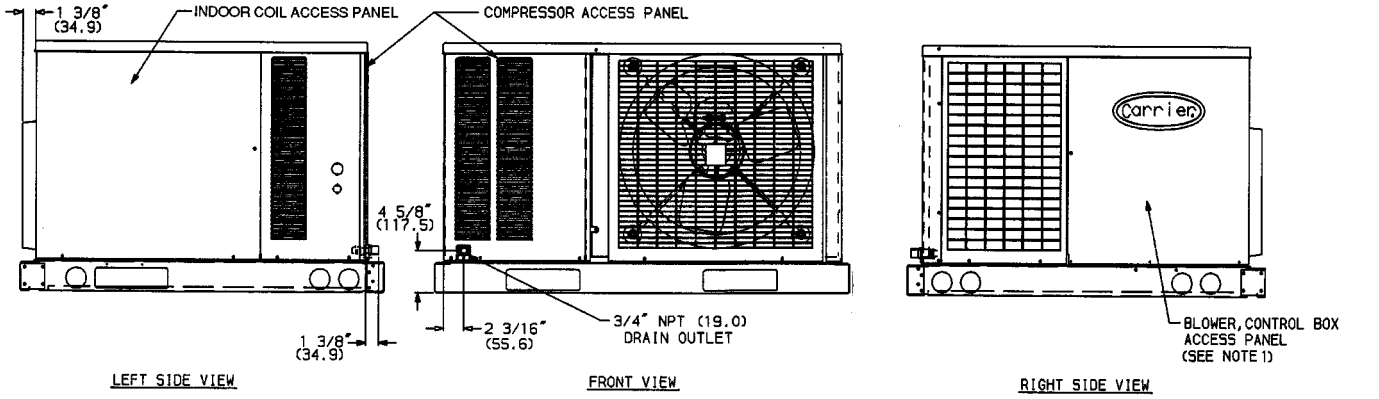
CG — Center of Gravity
MAT'L — Material
NEC — National Electrical Code (U.S.A. Standard)
REQ'D — Required

NOTES:
1. Clearances must be maintained to prevent recirculation of air from outdoor-fan discharge.
2. Dimensions in ( ) are in millimeters.









SIZES 048,060

UNIT	ELECTRICAL CHARACTERISTICS	UNIT WT		CORNER WT (Lb/Kg)			
		Lb	Kg	A	B	C	D
50HS048	220-3-50, 400-3-50	363	165	83/38	95/43	118/54	67/30
50HS060	220-3-50, 400-3-50	370	168	89/40	92/42	105/48	84/38

UNIT	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
50HS048	21.4/543	21.3/540	17.3/440
50HS060	19.4/493	21.2/539	17.3/440

REQ'D CLEARANCES FOR SERVICING — in. (mm)
Indoor Coil Access Side 30 (762)
Control Box Access Side 30 (762)
(Except for NEC requirements)
Unit Top 36 (914)
Side Opposite Ducts 30 (762)

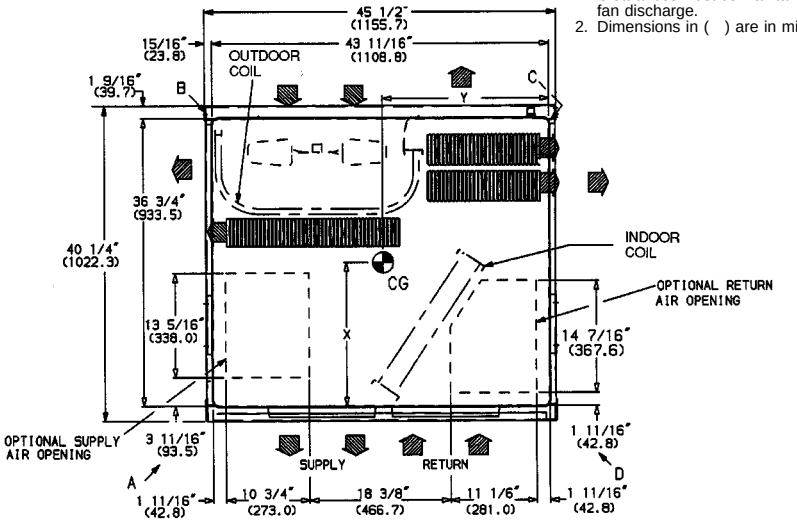
REQ'D CLEARANCES TO COMBUSTIBLE MAT'L — in. (mm)
Unit Top 0
Duct Side of Unit 0
Side Opposite Ducts 0
Bottom of Unit 0
Vertical Discharge, First 12 in. (305) of Supply Duct 1 (25)

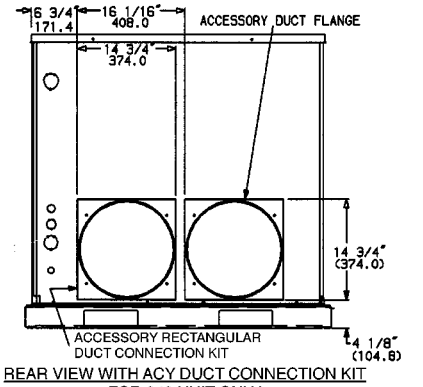
NEC REQ'D CLEARANCES — in. (mm)
Between Units, Control Box Side 42 (1067)
Unit and Ungrounded Surfaces, Control Box Side 36 (914)
Unit and Block or Concrete Walls and Other
Grounded Surfaces, Control Box Side 42 (1067)

LEGEND

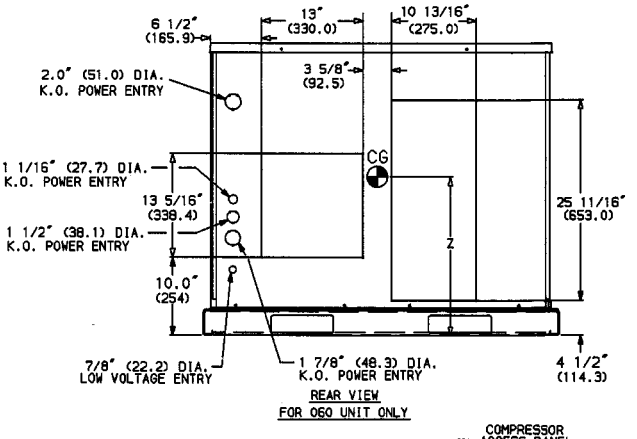
CG — Center of Gravity
MAT'L — Material
NEC — National Electrical Code (U.S.A. Standard)
REQ'D — Required

NOTES
1. Clearances must be maintained to prevent recirculation of air from outdoor-fan discharge.
2. Dimensions in ( ) are in millimeters.

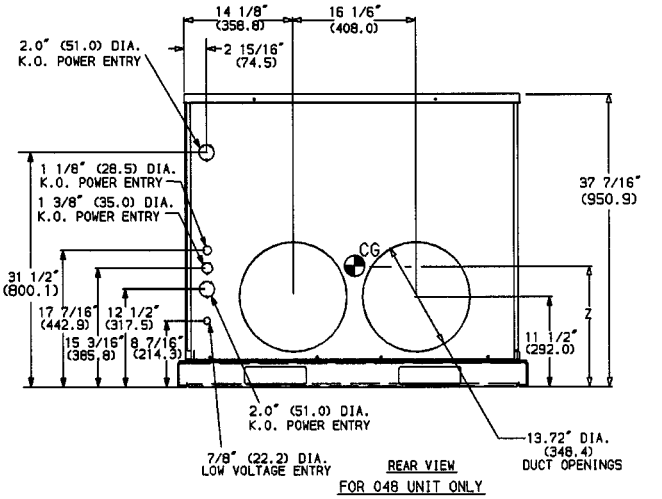




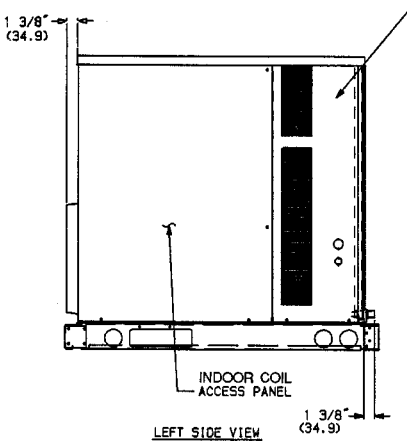
REAR VIEW WITH ACY DUCT CONNECTION KIT FOR 048 UNIT ONLY



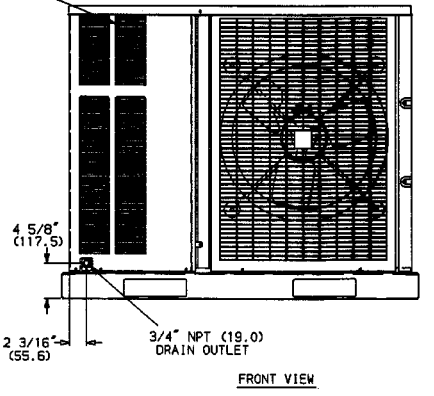
REAR VIEW FOR 060 UNIT ONLY



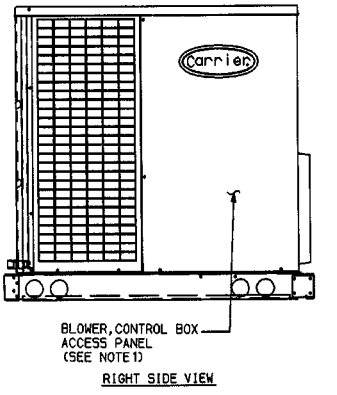
REAR VIEW FOR 048 UNIT ONLY



LEFT SIDE VIEW



FRONT VIEW



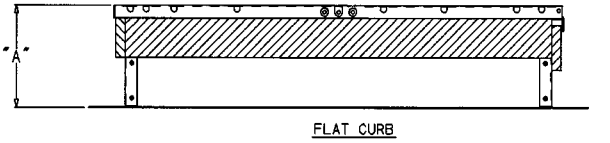
RIGHT SIDE VIEW

Dimensions (cont)

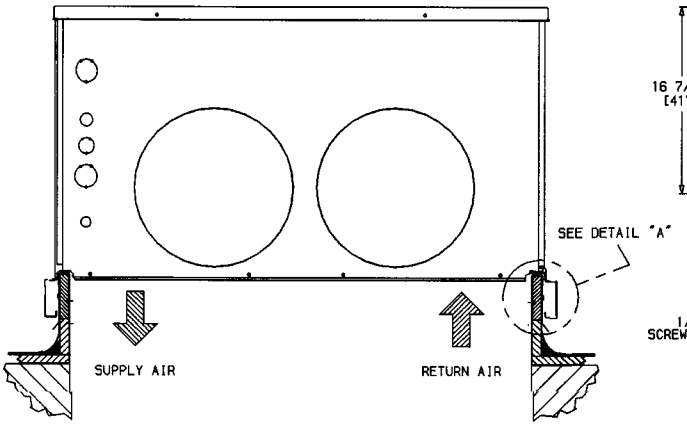
ROOF CURB DIMENSIONS

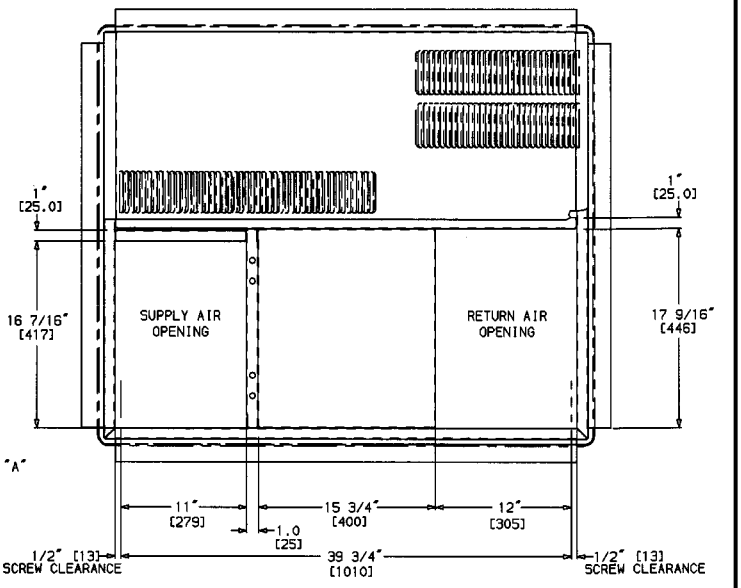
	PART NUMBER	"A"
Flat	50SS900015	8″ [203]
	50SS900016	11″ [279]
	50SS900017	14″ [356]

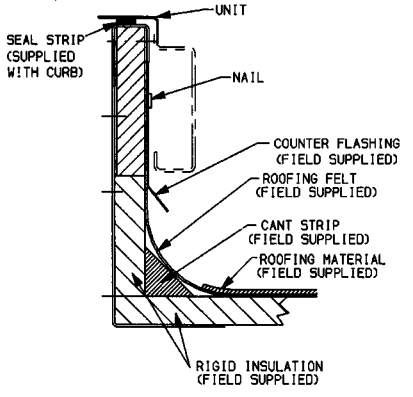
NOTES:
1. Roof curb must be set up for unit being installed.
2. Seal strip must be applied as required for unit being installed.
3. Dimensions in [ ] are in millimeters.
4. Roof curb is made of 1.5 mm (16 gage) steel.
5. Attach ductwork to curb (flanges of duct rest on curb).
6. Service clearance 1219 mm (4 ft) on each side.
7. ⇨ Direction of airflow.
8. Insulated panels: 25 mm (1-in.) thick fiberglass, 1-lb density.



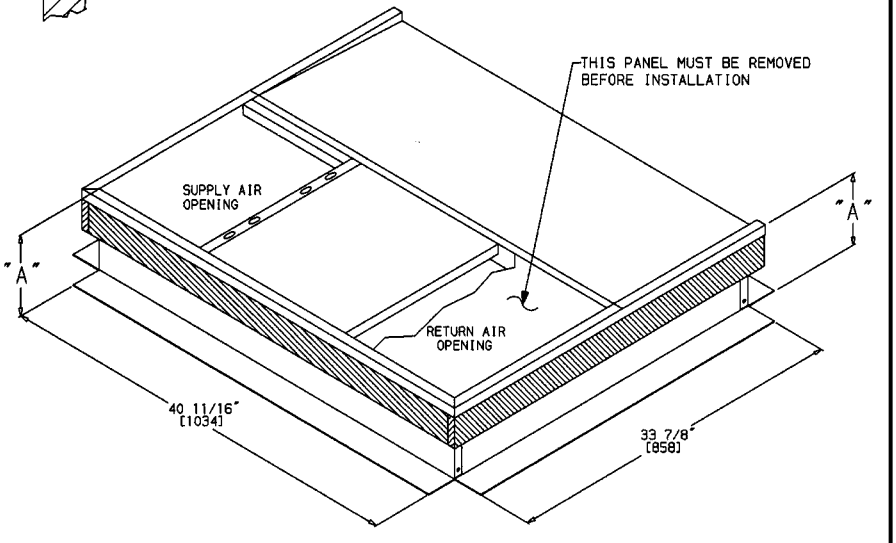
FLAT CURB







DETAIL "A"



Selection procedure — SI

I Determine cooling and heating requirements at design conditions.

Given:

Required Cooling Capacity (TC)	10.0 kW
Sensible Heat Capacity (SHC)	7.9 kW
Required Heating Capacity	11.7 kW
Outdoor Entering-Air Temperature	35 C
Outdoor-Air Winter Design Temperature	−7 C
Indoor-Air Winter Design Temperature	21 C
Indoor Entering-Air Temperature	26.7 C edb; 19 C ewb
Indoor-Air Quantity	569 L/s
External Static Pressure	50 Pa
Field-Supplied Filter Pressure Drop	24.9 Pa
Electrical Characteristics (V-Ph-Hz)	400-3-50

edb — Entering Dry Bulb
ewb — Entering Wet Bulb

II Select unit based on required cooling capacity.

Enter Cooling Capacities table at outdoor entering temperature of 35 C, indoor-air entering at 569 L/s and 19 C ewb. The 50HS036 unit provides a total cooling capacity of 10.2 kW and a sensible heat capacity of 8.06 kW.

For indoor-air temperature other than 26.7 C edb, calculate sensible heat capacity correction, as required, using the formula found in Note 4 following the Cooling Capacities tables.

NOTE: Unit ratings are net capacities.

III Select electric heat.

Enter the Heating Capacities table at 569 L/s. At 21 C return indoor air and −7 C air entering outdoor coil, the integrated heating capacity is 4.89 kW. (Select integrated heating capacity value since deductions for outdoor-coil frost and defrosting have already been made. No correction is required.)

The required heating capacity is 11.7 kW. Therefore, 6.81 kW (11.7 − 4.89) additional electric heat is required.

Enter the Accessory Electric Heater Packages table, page 20, for 50HS036 unit. The 6.9-kW heater at 400 v most closely satisfies the heating required.

Total unit heating capacity is 11.79 (4.89 + 6.9).

IV Determine fan speed and power requirements at design conditions.

Before entering the air delivery tables, calculate the total static pressure required. From the given, the Accessory Electric Heat Pressure Drop table (page 19), and the Wet Coil Pressure Drop table (page 19), find:

External static pressure	50.0 Pa
Filter	24.9 Pa
Electric heat	10.4 Pa
Wet coil	22.0 Pa
Total static pressure	107.3 Pa

Enter the table for Dry Coil Air Delivery, Horizontal and Vertical Discharge. At 125 Pa external static pressure and low speed, the motor delivers 596 L/s, which satisfies the job requirements.

Selection procedure — English

I Determine cooling and heating requirements at design conditions.

Given:

Required Cooling Capacity (TC) . . . . . 34,000 Btuh
Sensible Heat Capacity (SHC) . . . . . 27,000 Btuh
Required Heating Capacity . . . . . 40,000 Btuh
Outdoor Entering-Air Temperature . . . . . 95 F
Outdoor-Air Winter Design Temperature . . . . . 20 F
Indoor-Air Winter Design Temperature . . . . . 70 F
Indoor Entering-Air Temperature . . . . . 80 F edb; 67 F ewb
Indoor-Air Quantity . . . . . 1200 cfm
External Static Pressure . . . . . 0.20 in. wg
Field-Supplied Filter Pressure Drop . . . . 0.10 in. wg
Electrical Characteristics (V-Ph-Hz) 400-3-50

edb — Entering Dry Bulb
ewb — Entering Wet Bulb

II Select unit based on required cooling capacity.

Enter Cooling Capacities table at outdoor entering temperature of 95 F, indoor-air entering at 1200 cfm and 67 F ewb. The 50HS036 unit provides a total cooling capacity of 34,800 Btuh and a sensible heat capacity of 27,400 Btuh.

For indoor-air temperature other than 80 F edb, calculate sensible heat capacity correction, as required, using the formula found in Note 4 following the Cooling Capacities tables.

NOTE: Unit ratings are net capacities.

III Select electric heat.

Enter the Heating Capacities table at 1200 cfm. At 70 F return indoor air and 20 F air entering outdoor coil, the integrated heating capacity is 16,700 Btuh. (Select integrated heating capacity value since deductions for outdoor-coil frost and defrosting have already been made. No correction is required.)

The required heating capacity is 40,000 Btuh. Therefore, 23,300 Btuh (40,000 − 16,700) additional electric heat is required.

Determine additional electric heat capacity in kW.

$$\frac{23{,}300 \text{ Btuh}}{3414 \text{ Btuh/kW}} = 6.82 \text{ kW of heat required}$$

Enter the Accessory Electric Heater Packages table for 50HS036 unit. The 6.9-kW heater at 400 v most closely satisfies the heating required.

6.9 kW x 3414 = 23,557 Btuh

Total unit heating capacity is 40,257 Btuh (16,700 + 23,557).

IV Determine fan speed and power requirements at design conditions.

Before entering the air delivery tables, calculate the total static pressure required. From the given, the Accessory Electric Heat Pressure Drop table (page 19), and the Wet Coil Pressure Drop table (page 19), find:

External static pressure	0.20 in. wg
Filter	0.10 in. wg
Electric heat	0.042 in. wg
Wet coil	0.088 in. wg
Total static pressure	0.430 in. wg

Enter the table for Dry Coil Air Delivery, Horizontal and Vertical Discharge. At 0.50 in. wg external static pressure and low speed, the motor delivers 1264 cfm, which satisfies the job requirements.

Performance data

COOLING CAPACITIES — SI

50HS024

Temp (C) Outdoor Ent Air		Indoor Ent Air — L/s / BF								
		332/0.08			380/0.09			427/0.10		
		Indoor Ent Air — Ewb (C)								
		22	19	17	22	19	17	22	19	17
24	TC	8.70	7.90	7.08	8.84	8.08	7.25	8.90	8.18	7.38
	SHC	4.13	5.19	6.16	4.27	5.50	6.58	4.39	5.76	6.95
	kW	2.70	2.63	2.57	2.74	2.69	2.62	2.78	2.73	2.67
29	TC	8.28	7.46	6.65	8.46	7.62	6.81	8.53	7.73	6.95
	SHC	3.97	5.02	5.96	4.16	5.33	6.37	4.30	5.60	6.72
	kW	2.83	2.76	2.69	2.89	2.82	2.74	2.93	2.86	2.79
35	TC	7.85	7.01	6.23	7.97	7.16	6.38	8.07	7.25	6.51
	SHC	3.83	4.84	5.76	4.00	5.16	6.14	4.15	5.44	6.46
	kW	2.97	2.88	2.80	3.02	2.94	2.86	3.07	2.99	2.92
41	TC	7.37	6.54	5.81	7.48	6.67	5.95	7.57	6.75	6.12
	SHC	3.67	4.66	5.54	3.84	4.98	5.89	4.00	5.26	6.12
	kW	3.10	3.00	2.92	3.15	3.06	2.98	3.20	3.11	3.04
46	TC	6.88	6.07	5.40	6.99	6.18	5.59	7.07	6.25	5.77
	SHC	3.50	4.48	5.31	3.68	4.79	5.58	3.86	5.08	5.77
	kW	3.22	3.12	3.02	3.28	3.17	3.10	3.33	3.23	3.16
52	TC	6.37	5.60	5.03	6.47	5.69	5.23	6.54	5.75	5.40
	SHC	3.33	4.30	5.02	3.52	4.61	5.22	3.69	4.89	5.39
	kW	3.34	3.23	3.13	3.40	3.29	3.22	3.45	3.34	3.29

50HS030

Temp (C) Outdoor Ent Air		Indoor Ent Air — L/s / BF								
		415/0.10			474/0.11			533/0.13		
		Indoor Ent Air — Ewb (C)								
		22	19	17	22	19	17	22	19	17
24	TC	10.5	9.44	8.46	10.6	9.64	8.64	10.7	9.76	8.79
	SHC	4.98	6.27	7.46	5.14	6.64	7.95	5.28	6.97	8.39
	kW	3.20	3.10	3.01	3.26	3.18	3.09	3.33	3.25	3.16
29	TC	9.93	8.92	7.94	10.1	9.10	8.11	10.2	9.21	8.26
	SHC	4.79	6.07	7.22	4.98	6.44	7.69	5.15	6.78	8.09
	kW	3.39	3.28	3.18	3.46	3.36	3.26	3.53	3.43	3.34
35	TC	9.39	8.35	7.42	9.53	8.50	7.59	9.63	8.62	7.75
	SHC	4.60	5.85	6.96	4.81	6.22	7.39	4.99	6.58	7.74
	kW	3.58	3.46	3.34	3.66	3.54	3.43	3.72	3.61	3.51
41	TC	8.80	7.78	6.91	8.94	7.90	7.08	9.02	8.00	7.31
	SHC	4.41	5.64	6.68	4.62	6.01	7.06	4.81	6.35	7.30
	kW	3.76	3.62	3.50	3.84	3.70	3.59	3.91	3.78	3.68
46	TC	8.18	7.19	6.41	8.30	7.30	6.64	8.39	7.37	6.85
	SHC	4.20	5.41	6.37	4.42	5.78	6.63	4.62	6.12	6.85
	kW	3.93	3.78	3.64	4.01	3.86	3.75	4.09	3.94	3.85
52	TC	7.54	6.58	5.96	7.64	6.67	6.19	7.72	6.74	6.38
	SHC	3.99	5.19	5.94	4.22	5.55	6.19	4.42	5.88	6.37
	kW	4.10	3.93	3.80	4.17	4.01	3.92	4.25	4.09	4.02

50HS036

Temp (C) Outdoor Ent Air		Indoor Ent Air — L/s / BF								
		498/0.09			569/0.11			640/0.12		
		Indoor Ent Air — Ewb (C)								
		22	19	17	22	19	17	22	19	17
24	TC	12.8	11.6	10.5	13.0	11.7	10.7	13.1	11.9	10.9
	SHC	6.38	8.17	9.81	6.66	8.67	10.4	6.94	9.15	10.9
	kW	3.85	3.67	3.52	3.97	3.79	3.64	4.08	3.90	3.76
29	TC	12.0	10.9	9.86	12.1	11.0	10.1	12.3	11.1	10.3
	SHC	6.09	7.87	9.45	6.38	8.37	9.97	6.65	8.84	10.3
	kW	4.04	3.86	3.69	4.16	3.97	3.82	4.27	4.08	3.95
35	TC	11.2	10.1	9.20	11.3	10.2	9.43	11.4	10.3	9.67
	SHC	5.81	7.57	9.05	6.09	8.06	9.43	6.36	8.52	9.66
	kW	4.23	4.03	3.87	4.34	4.14	4.00	4.45	4.25	4.14
41	TC	10.4	9.32	8.56	10.5	9.41	8.82	10.5	9.47	9.03
	SHC	5.52	7.26	8.54	5.80	7.74	8.82	6.07	8.19	9.03
	kW	4.40	4.20	4.04	4.52	4.31	4.19	4.63	4.42	4.33
46	TC	9.52	8.53	7.94	9.59	8.60	8.18	9.63	8.64	8.37
	SHC	5.24	6.95	7.94	5.52	7.42	8.18	5.78	7.84	8.37
	kW	4.57	4.35	4.22	4.68	4.46	4.37	4.79	4.57	4.51
52	TC	8.66	7.72	7.30	8.72	7.79	7.53	8.74	7.83	7.70
	SHC	4.95	6.63	7.30	5.23	7.07	7.53	5.49	7.43	7.70
	kW	4.72	4.49	4.39	4.83	4.61	4.54	4.94	4.72	4.68

50HS048

Temp (C) Outdoor Ent Air		Indoor Ent Air — L/s / BF								
		664/0.08			7.59/0.09			854/0.10		
		Indoor Ent Air — Ewb (C)								
		22	19	17	22	19	17	22	19	17
24	TC	16.2	14.7	13.4	16.4	15.0	13.6	16.6	15.1	13.8
	SHC	7.80	9.99	12.1	8.11	10.6	12.9	8.45	11.1	13.6
	kW	4.68	4.60	4.53	4.78	4.70	4.64	4.90	4.81	4.74
29	TC	15.6	14.2	12.7	15.9	14.4	13.0	15.9	14.5	13.2
	SHC	7.63	9.80	11.8	7.95	10.4	12.6	8.21	11.0	13.2
	kW	5.09	5.00	4.92	5.20	5.11	5.03	5.30	5.22	5.14
35	TC	15.0	13.5	12.1	15.1	13.7	12.4	15.3	13.8	12.7
	SHC	7.39	9.54	11.5	7.72	10.1	12.2	8.05	10.7	12.7
	kW	5.54	5.44	5.36	5.64	5.55	5.47	5.76	5.66	5.59
41	TC	14.2	12.8	11.5	14.4	12.9	11.7	14.5	13.0	12.1
	SHC	7.16	9.27	11.2	7.48	9.90	11.7	7.83	10.5	12.1
	kW	6.03	5.93	5.83	6.14	6.04	5.96	6.26	6.15	6.09
46	TC	13.5	12.0	10.8	13.6	12.2	11.2	13.7	12.3	11.5
	SHC	6.91	8.99	10.8	7.26	9.61	11.2	7.57	10.2	11.5
	kW	6.56	6.46	6.35	6.67	6.58	6.49	6.79	6.69	6.63

50HS060

Temp (C) Outdoor Ent Air		Indoor Ent Air — L/s / BF								
		830/0.08			949/0.09			1067/0.10		
		Indoor Ent Air — Ewb (C)								
		22	19	17	22	19	17	22	19	17
24	TC	20.1	18.4	16.7	20.3	18.7	16.9	20.6	18.8	17.1
	SHC	9.62	12.4	15.0	10.0	13.2	16.0	10.4	13.9	16.8
	kW	6.06	5.91	5.75	6.20	6.06	5.89	6.37	6.20	6.03
29	TC	19.4	17.7	16.0	19.6	17.9	16.2	19.7	18.1	16.4
	SHC	9.43	12.2	14.7	9.83	12.9	15.6	10.1	13.6	16.4
	kW	6.65	6.47	6.28	6.79	6.62	6.43	6.93	6.75	6.57
35	TC	18.7	16.9	15.2	18.9	17.1	15.5	19.0	17.3	15.8
	SHC	9.19	11.9	14.3	9.58	12.6	15.2	9.94	13.3	15.8
	kW	7.28	7.07	6.85	7.43	7.23	7.02	7.56	7.37	7.16
41	TC	17.8	16.1	14.5	18.0	16.3	14.8	18.1	16.4	15.2
	SHC	8.91	11.6	13.9	9.30	12.3	14.7	9.68	13.0	15.1
	kW	7.92	7.71	7.46	8.08	7.87	7.64	8.21	8.02	7.84
46	TC	16.9	15.2	13.7	17.1	15.4	14.1	17.2	15.5	14.5
	SHC	8.60	11.2	13.5	9.01	12.0	14.1	9.39	12.7	14.4
	kW	8.59	8.38	8.10	8.74	8.54	8.31	8.89	8.68	8.52
52	TC	16.0	14.4	13.0	16.1	14.5	13.4	16.2	14.6	13.8
	SHC	8.29	10.9	13.0	8.68	11.6	13.4	9.09	12.4	13.8
	kW	9.32	9.07	8.78	9.46	9.22	9.01	9.61	9.37	9.23

LEGEND

BF — Bypass Factor
Edb — Entering Dry Bulb
Ent — Entering
Ewb — Entering Wet Bulb
kW — Total Unit Power Input
ldb — Leaving Dry Bulb
lwb — Leaving Wet Bulb
SHC — Sensible Heat Capacity, kW
TC — Total Cooling Capacity, kW (net)

NOTES:
1. Total cooling ratings are net; they account for the effects of the indoor-fan motor power and heat.
2. Direct interpolation is permissible. Do not extrapolate.
3. Formulas:

$$C_{ldb} = C_{edb} - \frac{SHC_{kW} \times 1000}{1.23 \times L/s}$$

Leaving wet-bulb = wet-bulb temperature corresponding to enthalpy of air leaving coil (h_{lwb}).

$$h_{lwb} = h_{ewb} - \frac{TC_{kW} \times 100}{1.20 \times L/s}$$

Where h_{ewb} is enthalpy of air entering indoor coil.

4. SHC is based on 26.7 C db temperature of air entering the unit. At any other temperature, correct the SHC read from the table of cooling capacities as follows:

$$\text{Corrected } SHC_{kW} = SHC + [1.23 \times 10^{-3} \times (1 - BF) \times (C_{db} - 26.7) \times L/s]$$

Above 26.7 C, SHC correction is positive; add it to SHC. Below 26.7 C, SHC correction is negative; subtract it from SHC.

Performance data (cont)

COOLING CAPACITIES — ENGLISH

50HS024

Temp (F) Outdoor Ent Air		Indoor Ent Air — Cfm/BF								
		700/0.08			800/0.09			900/0.10		
		Indoor Ent Air — Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	29.7	27.0	24.1	30.2	27.5	24.7	30.4	27.9	25.2
	SHC	14.1	17.7	21.0	14.6	18.7	22.4	14.9	19.6	23.7
	kW	2.69	2.63	2.57	2.74	2.69	2.62	2.78	2.73	2.67
85	TC	28.2	25.4	22.7	28.9	26.0	23.2	29.1	26.4	23.7
	SHC	13.5	17.1	20.3	14.2	18.1	21.7	14.7	19.1	22.9
	kW	2.83	2.76	2.69	2.89	2.81	2.74	2.93	2.86	2.79
95	TC	26.8	23.9	21.2	27.2	24.4	21.7	27.5	24.7	22.2
	SHC	13.1	16.5	19.6	13.6	17.5	20.9	14.1	18.5	22.0
	kW	2.97	2.88	2.80	3.02	2.94	2.86	3.07	2.99	2.92
105	TC	25.1	22.3	19.8	25.5	22.7	20.3	25.8	23.0	20.9
	SHC	12.5	15.9	18.9	13.1	16.9	20.1	13.6	17.9	20.9
	kW	3.09	3.00	2.92	3.15	3.06	2.98	3.20	3.11	3.04
115	TC	23.4	20.7	18.4	23.8	21.1	19.0	24.1	21.3	19.7
	SHC	11.9	15.3	18.1	12.5	16.3	19.0	13.1	17.3	19.6
	kW	3.22	3.12	3.02	3.28	3.17	3.09	3.33	3.23	3.16
125	TC	21.7	19.1	17.1	22.1	19.4	17.8	22.3	19.6	18.4
	SHC	11.4	14.6	17.1	12.0	15.7	17.8	12.6	16.6	18.4
	kW	3.34	3.22	3.13	3.40	3.28	3.21	3.45	3.33	3.29

50HS030

Temp (F) Outdoor Ent Air		Indoor Ent Air — Cfm/BF								
		875/0.10			1000/0.11			1125/0.13		
		Indoor Ent Air — Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	35.7	32.2	28.8	36.1	32.9	29.5	36.5	33.3	30.0
	SHC	17.0	21.3	25.4	17.5	22.6	27.1	18.0	23.7	28.6
	kW	3.20	3.10	3.01	3.26	3.18	3.09	3.33	3.25	3.16
85	TC	33.9	20.4	27.1	34.4	31.0	27.6	34.8	31.4	28.2
	SHC	16.3	30.7	24.6	17.0	21.9	26.2	17.5	23.1	27.5
	kW	3.38	3.28	3.17	3.46	3.36	3.26	3.53	3.43	3.34
95	TC	32.0	28.5	25.3	32.5	29.0	25.9	32.8	29.4	26.4
	SHC	15.7	19.9	23.7	16.4	21.2	25.2	17.0	22.4	26.4
	kW	3.58	3.45	3.34	3.65	3.53	3.42	3.72	3.61	3.51
105	TC	30.0	26.5	23.5	30.5	27.0	24.1	30.8	27.3	24.9
	SHC	15.0	19.2	22.8	15.7	20.4	24.1	16.4	21.6	24.9
	kW	3.76	3.62	3.49	3.84	3.70	3.58	3.91	3.77	3.68
115	TC	27.9	25.4	21.9	28.3	24.9	22.6	28.6	25.1	23.3
	SHC	14.3	18.4	21.7	15.0	19.7	22.6	15.7	20.8	23.3
	kW	3.93	3.77	3.64	4.01	3.86	3.75	4.08	3.94	3.85
125	TC	25.7	22.5	20.3	26.1	22.8	21.1	26.3	23.0	21.7
	SHC	13.6	17.6	20.3	14.4	18.9	21.1	15.1	20.0	21.7
	kW	4.09	3.93	3.80	4.17	4.01	3.91	4.25	4.09	4.02

50HS036

Temp (F) Outdoor Ent Air		Indoor Ent Air — Cfm/BF								
		1050/0.09			1200/0.11			1350/0.12		
		Indoor Ent Air — Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	43.6	39.5	35.9	44.3	40.1	36.6	44.7	40.5	37.2
	SHC	21.7	27.8	33.4	22.7	29.5	35.4	23.6	31.1	37.0
	kW	3.84	3.67	3.52	3.96	3.78	3.63	4.07	3.89	3.75
85	TC	40.9	37.0	33.6	41.4	37.5	34.3	41.8	37.8	35.0
	SHC	20.7	26.8	32.2	21.7	28.5	34.0	22.6	30.1	35.0
	kW	4.04	3.85	3.69	4.15	3.97	3.81	4.26	4.07	3.94
95	TC	38.1	34.4	31.3	38.5	34.8	32.1	38.8	35.0	32.9
	SHC	19.8	25.7	30.8	20.7	27.4	32.1	21.7	29.0	32.9
	kW	4.22	4.03	3.86	4.34	4.14	4.00	4.45	4.25	4.14
105	TC	35.3	31.8	29.2	35.7	32.1	30.1	35.8	32.3	30.8
	SHC	18.8	24.7	29.1	19.7	26.3	30.1	20.7	27.9	30.8
	kW	4.40	4.19	4.03	4.52	4.31	4.18	4.62	4.41	4.32
115	TC	32.5	29.1	27.1	32.7	29.3	27.9	32.9	29.5	28.5
	SHC	17.8	23.6	27.1	18.8	25.2	27.9	19.7	26.7	28.5
	kW	4.56	4.34	4.21	4.68	4.46	4.37	4.79	4.57	4.51
125	TC	29.6	26.3	24.9	29.7	26.6	25.7	29.8	26.7	26.2
	SHC	16.9	22.6	24.9	17.8	24.1	25.7	18.7	25.3	26.2
	kW	4.72	4.48	4.38	4.83	4.60	4.54	4.94	4.71	4.68

50HS048

Temp (F) Outdoor Ent Air		Indoor Ent Air — Cfm/BF								
		1400/0.07			1600/0.08			1800/0.10		
		Indoor Ent Air — Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	55.2	50.2	45.6	56.0	51.0	46.3	56.8	51.5	47.0
	SHC	26.6	34.0	41.2	27.6	36.0	43.8	28.8	37.8	46.2
	kW	4.67	4.59	4.52	4.78	4.70	4.63	4.89	4.80	4.74
85	TC	53.3	48.3	43.4	54.1	49.0	44.3	54.4	49.4	45.0
	SHC	26.0	33.4	40.2	27.1	35.4	42.9	28.0	37.3	44.9
	kW	5.09	5.00	4.92	5.20	5.11	5.03	5.29	5.21	5.14
95	TC	51.0	46.0	41.3	51.6	46.6	42.1	52.1	47.0	43.2
	SHC	25.2	32.5	39.1	26.3	34.5	41.7	27.4	36.5	43.2
	kW	5.53	5.44	5.36	5.64	5.55	5.46	5.76	5.66	5.58
105	TC	48.6	43.5	39.1	49.1	44.2	40.0	49.5	44.5	41.2
	SHC	24.4	31.6	38.0	25.5	33.7	40.0	26.7	35.7	41.2
	kW	6.03	5.93	5.83	6.14	6.04	5.95	6.25	6.14	6.08
115	TC	46.0	41.0	36.9	46.5	41.5	38.1	46.8	41.8	39.1
	SHC	23.5	30.6	36.7	24.7	32.7	38.1	25.8	34.6	39.1
	kW	6.56	6.46	6.35	6.67	6.57	6.49	6.79	6.68	6.62

50HS060

Temp (F) Outdoor Ent Air		Indoor Ent Air — Cfm/BF								
		1750/0.08			2000/0.09			2250/0.10		
		Indoor Ent Air — Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	68.4	62.7	56.9	69.3	63.6	57.6	70.3	64.3	58.4
	SHC	32.8	42.2	51.1	34.1	44.8	54.3	35.5	47.2	57.2
	kW	6.05	5.91	5.74	6.20	6.05	5.88	6.36	6.19	6.02
85	TC	66.3	60.4	54.4	67.0	61.1	55.3	67.4	61.6	56.0
	SHC	32.1	41.4	50.0	33.5	43.8	53.2	34.5	46.2	55.8
	kW	6.64	6.46	6.27	6.79	6.61	6.42	6.92	6.75	6.57
95	TC	63.7	57.8	52.0	64.4	58.5	52.8	64.7	58.9	53.9
	SHC	31.3	40.5	48.7	32.6	42.9	51.9	33.9	45.3	53.8
	kW	7.28	7.06	6.84	7.43	7.22	7.01	7.56	7.36	7.16
105	TC	60.7	54.9	49.4	61.5	55.5	50.3	61.8	56.0	51.7
	SHC	30.3	39.4	47.5	31.7	41.9	50.2	33.0	44.4	51.6
	kW	7.92	7.70	7.45	8.07	7.86	7.63	8.21	8.01	7.83
115	TC	57.6	52.0	46.8	58.2	52.5	48.0	58.6	52.8	49.3
	SHC	29.3	38.3	46.0	30.7	40.8	48.0	32.0	43.2	49.2
	kW	8.58	8.38	8.09	8.74	8.53	8.30	8.88	8.68	8.51
125	TC	54.5	49.0	44.4	54.8	49.4	45.8	55.1	49.7	46.9
	SHC	28.2	37.1	44.3	29.5	39.6	45.7	31.0	42.0	46.9
	kW	9.31	9.06	8.77	9.46	9.21	9.00	9.61	9.36	9.22

LEGEND

BF — Bypass Factor
Edb — Entering Dry-Bulb
Ent — Entering
Ewb — Entering Wet-Bulb
kW — Total Unit Power Input
ldb — Leaving Dry Bulb
lwb — Leaving Wet Bulb
SHC — Sensible Heat Capacity, 1000 Btuh
TC — Total Cooling Capacity, 1000 Btuh (net)

NOTES:
1. Ratings are net; they account for the effects of the indoor-fan motor power and heat.
2. Direct interpolation is permissible. Do not extrapolate.
3. The following formulas may be used:

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

t_{lwb} = Wet-bulb temperature corresponding to enthalpy of air leaving indoor coil (h_{lwb})

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where: h_{ewb} = Enthalpy of air entering indoor coil

4. The SHC is based on 80 F edb temperature of air entering indoor coil. Below 80 F edb, subtract (corr factor x cfm) from SHC. *Above 80 F edb, add (corr factor x cfm) to SHC.* Correction Factor = 1.10 x (1 – BF) x (edb – 80).

HEATING CAPACITIES — SI

50HS024

Return Air (C db)	L/s (Std Air)		Air Temperature Entering Outdoor Coil (C)																	
			−23		−18		−12		−8		−7		−1		4		8		10		16	
16	332	Cap.	1.53	1.41	2.18	2.01	2.93	2.68	3.46	3.15	3.76	3.39	4.76	4.17	6.06	5.82	6.98	6.98	7.45	7.45	9.03	9.03
		kW	1.78		1.86		1.93		1.98		2.01		2.09		2.18		2.25		2.28		2.38	
	380	Cap.	1.58	1.45	2.23	2.06	3.00	2.74	3.53	3.22	3.84	3.46	4.86	4.26	6.20	5.95	7.13	7.13	7.61	7.61	9.19	9.19
		kW	1.83		1.90		1.97		2.02		2.04		2.11		2.20		2.26		2.29		2.37	
	427	Cap.	1.62	1.49	2.29	2.10	3.06	2.79	3.60	3.28	3.91	3.52	4.95	4.34	6.31	6.05	7.26	7.26	7.73	7.73	9.29	9.29
		kW	1.87		1.95		2.01		2.05		2.07		2.14		2.22		2.28		2.30		2.37	
21	332	Cap.	1.35	1.24	2.00	1.84	2.75	2.51	3.28	2.99	3.56	3.21	4.53	3.97	5.78	5.55	6.66	6.66	7.12	7.12	8.65	8.65
		kW	1.80		1.89		1.97		2.03		2.06		2.15		2.26		2.33		2.37		2.48	
	380	Cap.	1.40	1.28	2.05	1.88	2.81	2.57	3.35	3.05	3.64	3.28	4.62	4.05	5.91	5.67	6.81	6.81	7.28	7.28	8.85	8.85
		kW	1.84		1.93		2.01		2.07		2.09		2.18		2.28		2.35		2.38		2.48	
	427	Cap.	1.44	1.32	2.10	1.93	2.87	2.62	3.41	3.11	3.70	3.34	4.71	4.12	6.01	5.77	6.93	6.93	7.41	7.41	9.01	9.01
		kW	1.89		1.98		2.05		2.10		2.13		2.21		2.30		2.36		2.39		2.48	
27	332	Cap.	1.15	1.06	1.79	1.65	2.54	2.33	3.07	2.80	3.35	3.02	4.27	3.76	5.49	5.28	6.34	6.34	6.78	6.78	8.26	8.26
		kW	1.81		1.91		2.01		2.08		2.11		2.21		2.33		2.41		2.45		2.57	
	380	Cap.	1.19	1.10	1.84	1.69	2.61	2.39	3.15	2.87	3.43	3.09	4.38	3.84	5.62	5.40	6.48	6.48	6.94	6.94	8.46	8.46
		kW	1.86		1.95		2.05		2.11		2.14		2.24		2.35		2.42		2.46		2.57	
	427	Cap.	1.24	1.14	1.90	1.74	2.67	2.44	3.21	2.93	3.50	3.16	4.47	3.91	5.72	5.50	6.61	6.61	7.07	7.07	8.61	8.61
		kW	1.90		2.00		2.09		2.15		2.18		2.27		2.37		2.44		2.47		2.58	

LEGEND

Cap. — Heating Capacity (kW) (Includes indoor-fan motor heat)
kW — Total Power Input (Includes compressor motor power input, outdoor-fan motor power input, and indoor-fan motor power input)

NOTES:

1. ▭ indicates integrated ratings.
2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

50HS030

Return Air (C db)	L/s (Std Air)		Air Temperature Entering Outdoor Coil (C)																	
			−23		−18		−12		−8		−7		−1		4		8		10		16	
16	415	Cap.	1.66	1.53	2.49	2.29	3.45	3.15	4.12	3.75	4.48	4.04	5.69	4.98	7.23	6.94	8.32	8.32	8.88	8.88	10.7	10.7
		kW	1.92		2.03		2.13		2.21		2.24		2.36		2.49		2.59		2.63		2.78	
	474	Cap.	1.72	1.58	2.56	2.35	3.53	3.22	4.20	3.83	4.57	4.12	5.80	5.09	7.39	7.09	8.49	8.49	9.07	9.07	11.0	11.0
		kW	1.97		2.07		2.17		2.25		2.28		2.39		2.51		2.60		2.64		2.77	
	533	Cap.	1.77	1.63	2.62	2.41	3.60	3.29	4.28	3.90	4.65	4.20	5.91	5.18	7.52	7.21	8.64	8.64	9.23	9.23	11.2	11.2
		kW	2.02		2.12		2.22		2.29		2.32		2.42		2.53		2.61		2.65		2.77	
21	415	Cap.	1.37	1.26	2.20	2.03	3.16	2.89	3.83	3.50	4.19	3.78	5.38	4.71	6.87	6.60	7.92	7.92	8.46	8.46	10.3	10.3
		kW	1.93		2.06		2.18		2.26		2.30		2.44		2.58		2.69		2.74		2.90	
	474	Cap.	1.43	1.31	2.27	2.09	3.25	2.97	3.93	3.58	4.29	3.87	5.49	4.81	7.02	6.74	8.09	8.09	8.65	8.65	10.5	10.5
		kW	1.98		2.10		2.22		2.30		2.34		2.47		2.60		2.70		2.74		2.89	
	533	Cap.	1.48	1.36	2.33	2.15	3.32	3.04	4.01	3.66	4.38	3.95	5.60	4.90	7.15	6.87	8.24	8.24	8.81	8.81	10.7	10.7
		kW	2.03		2.15		2.26		2.34		2.38		2.50		2.63		2.72		2.76		2.90	
27	415	Cap.	1.05	.966	1.87	1.72	2.84	2.60	3.52	3.21	3.87	3.49	5.05	4.42	6.50	6.25	7.52	7.52	8.05	8.05	9.81	9.81
		kW	1.94		2.08		2.21		2.31		2.36		2.50		2.67		2.78		2.84		3.01	
	474	Cap.	1.10	1.01	1.94	1.79	2.92	2.67	3.61	3.29	3.97	3.58	5.70	4.53	6.65	6.39	7.70	7.69	8.24	8.24	10.0	10.0
		kW	1.99		2.12		2.26		2.35		2.39		2.53		2.69		2.80		2.85		3.01	
	533	Cap.	1.15	1.05	2.01	1.85	3.00	2.74	3.69	3.37	4.05	3.65	5.27	4.62	6.78	6.51	7.84	7.84	8.39	8.39	10.2	10.2
		kW	2.03		2.17		2.30		2.39		2.43		2.57		2.71		2.82		2.86		3.02	

LEGEND

Cap. — Heating Capacity (kW) (Includes indoor-fan motor heat)
kW — Total Power Input (Includes compressor motor power input, outdoor-fan motor power input, and indoor-fan motor power input)

NOTES:

1. ▭ indicates integrated ratings.
2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

Performance data (cont)

HEATING CAPACITIES — SI (cont)

50HS036

Return Air (C db)	L/s (Std Air)		Temperature Air Entering Outdoor Coil (C)																	
			−23		−18		−12		−8		−7		−1		4		8		10		16	
16	498	Cap.	2.22	2.04	3.20	2.94	4.35	3.98	5.16	4.70	5.60	5.04	7.08	6.20	8.98	8.62	10.3	10.3	11.0	11.0	13.3	13.3
		kW	2.23		2.39		2.54		2.64		2.69		2.87		3.06		3.20		3.27		3.50	
	569	Cap.	2.30	2.11	3.29	3.03	4.46	4.08	5.28	4.81	5.73	5.16	7.23	6.34	9.17	8.80	10.5	10.5	11.2	11.2	13.6	13.6
		kW	2.31		2.46		2.61		2.71		2.76		2.92		3.10		3.24		3.30		3.51	
	640	Cap.	2.37	2.18	3.38	3.11	4.56	4.17	5.39	4.91	5.84	5.27	7.37	6.46	9.34	8.97	10.7	10.7	11.4	11.4	13.8	13.8
		kW	2.40		2.54		2.68		2.78		2.82		2.98		3.15		3.28		3.34		3.54	
21	498	Cap.	1.93	1.78	2.90	2.67	4.06	3.71	4.87	4.44	5.30	4.78	6.75	5.91	8.58	8.24	9.87	9.87	10.5	10.5	12.8	12.8
		kW	2.26		2.43		2.60		2.72		2.77		2.96		3.18		3.33		3.40		3.65	
	569	Cap.	2.02	1.85	3.00	2.76	4.17	3. 81	4.99	4.55	5.43	4.89	6.89	6.04	8.77	8.42	10.1	10.1	10.8	10.8	13.1	13.1
		kW	2.34		2.51		2.67		2.78		2.84		3.02		3.22		3.37		3.44		3.66	
	640	Cap.	2.09	1.92	3.08	2.84	4.27	3.90	5.10	4.65	5.54	5.00	7.03	6.16	8.94	8.58	10.3	10.3	11.0	11.0	13.3	13.3
		kW	2.42		2.58		2.74		2.85		2.90		3.08		3.28		3.41		3.48		3.69	
27	498	Cap.	1.61	1.49	2.57	2.36	3.72	3.40	4.53	4.13	4.96	4.47	6.39	5.60	8.18	7.85	9.43	9.43	10.1	10.1	12.2	12.2
		kW	2.28		2.46		2.65		2.78		2.84		3.05		3.29		3.45		3.53		3.79	
	569	Cap.	1.69	1.55	2.66	2.45	3.84	3.51	4.66	4.25	5.09	4.59	6.54	5.73	8.36	8.03	9.64	9.64	10.3	10.3	12.5	12.5
		kW	2.36		3.54		2.72		2.85		2.91		3.11		3.33		3.49		3.56		3.81	
	640	Cap.	1.76	1.62	2.75	2.53	3.94	3.60	4.77	4.35	5.21	4.69	6.68	5.85	8.53	8.19	9.82	9.82	10.5	10.5	12.8	12.8
		kW	2.44		2.62		2.80		2.92		2.98		3.17		3.39		3.54		3.61		3.84	

LEGEND

Cap. — Heating Capacity (kW) (Includes Indoor-Fan Motor Heat)
kW — Total Power Input (Includes Compressor Motor Power Input, Outdoor-Fan Motor Input, and Indoor-Fan Motor Input)

NOTES:

1. [ ] indicates integrated ratings.
2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

50HS048

Return Air (C db)	L/s (Std Air)		Air Temperature Entering Outdoor Coil (C)																	
			−23		−18		−12		−8		−7		−1		4		8		10		16	
16	664	Cap.	4.47	4.11	5.80	5.34	7.23	6.61	8.23	7.51	8.79	7.93	10.7	9.34	13.0	12.5	14.7	14.7	15.5	15.5	18.0	18.0
		kW	3.45		3.60		3.70		3.76		3.80		3.93		4.11		4.23		4.29		4.48	
	759	Cap.	4.58	4.21	5.91	5.44	7.35	6.72	8.36	7.62	8.92	8.04	10.8	9.46	13.2	12.7	14.9	14.9	15.6	15.6	17.9	17.9
		kW	3.53		3.66		3.74		3.80		3.83		3.94		4.11		4.22		4.26		4.41	
	854	Cap.	4.69	4.31	6.01	5.53	7.45	6.81	8.46	7.71	9.03	8.14	10.9	9.58	13.4	12.8	15.1	15.1	15.8	15.8	18.1	18.1
		kW	3.61		3.72		3.80		3.85		3.88		3.99		4.13		4.24		4.28		4.41	
21	664	Cap.	4.07	3.74	5.59	5.14	7.06	6.46	8.10	7.38	8.64	7.80	10.5	9.18	12.8	12.3	14.4	14.4	15.2	15.2	17.7	17.7
		kW	3.56		3.82		3.97		4.07		4.12		4.26		4.46		4.59		4.66		4.87	
	759	Cap.	4.20	3.87	5.72	5.26	7.19	6.57	8.21	7.49	8.76	7.90	10.6	9.30	13.0	12.4	14.6	14.6	15.4	15.4	17.9	17.9
		kW	3.65		3.88		4.01		4.10		4.14		4.27		4.44		4.57		4.62		4.81	
	854	Cap.	4.33	3.98	5.83	5.36	7.30	6.67	8.33	7.59	8.88	8.01	10.7	9.41	13.1	12.6	14.8	14.8	15.5	15.5	17.9	17.9
		kW	3.73		3.95		4.07		4.15		4.18		4.30		4.46		4.57		4.62		4.77	
27	664	Cap.	3.47	3.19	5.16	4.75	6.78	6.20	7.91	7.22	8.46	7.63	10.3	9.03	12.6	12.0	14.2	14.2	15.0	15.0	17.6	17.6
		kW	3.56		3.96		4.21		4.39		4.44		4.63		4.85		5.00		5.07		5.33	
	759	Cap.	3.61	3.32	5.32	4.89	6.92	6.33	8.05	7.34	8.60	7.75	10.4	9.15	12.7	12.2	14.3	14.3	15.1	15.1	17.7	17.7
		kW	3.66		4.04		4.26		4.42		4.47		4.63		4.82		4.95		5.02		5.23	
	854	Cap.	3.75	3.45	5.45	5.02	7.05	6.45	8.17	7.45	8.72	7.86	10.6	9.26	12.9	12.3	14.5	14.5	15.3	15.3	17.8	17.8
		kW	3.75		4.12		4.32		4.46		4.50		4.65		4.82		4.95		5.00		5.18	

LEGEND

Cap. — Heating Capacity (kW) (Includes Indoor-Fan Motor Heat)
kW — Total Power Input (Includes Compressor Motor Power Input, Outdoor-Fan Motor Input, and Indoor-Fan Motor Input)

NOTES:

1. [ ] indicates integrated ratings.
2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

HEATING CAPACITIES — SI (cont)

50HS060

Return Air (C db)	L/s (Std Air)		Air Temperature Entering Outdoor Coil (C)																	
			−23		−18		−12		−8		−7		−1		4		8		10		16	
16	830	Cap.	5.79	5.33	7.37	6.78	9.05	8.28	10.2	9.33	10.9	9.81	13.0	11.4	15.7	15.0	17.5	17.5	18.3	18.3	20.9	20.9
		kW	4.00		4.18		4.36		4.48		4.55		4.77		5.03		5.21		5.29		5.55	
	949	Cap.	5.91	5.44	7.50	6.90	9.18	8.39	10.4	9.44	11.0	9.93	13.2	11.6	15.8	15.2	17.7	17.7	18.4	18.4	20.6	20.6
		kW	4.07		4.24		4.41		4.53		4.59		4.79		5.02		5.18		5.24		5.43	
	1067	Cap.	6.03	5.55	7.62	7.01	9.30	8.51	10.5	9.56	11.1	10.1	13.3	11.7	16.0	15.3	17.9	17.9	18.5	18.5	20.7	20.7
		kW	4.16		4.32		4.47		4.58		4.64		4.83		5.04		5.19		5.24		5.40	
21	830	Cap.	5.57	5.13	7.17	6.59	8.87	8.11	10.1	9.18	10.7	9.66	12.9	11.3	15.4	14.8	17.2	17.2	18.0	18.0	20.7	20.7
		kW	4.27		4.47		4.68		4.83		4.91		5.16		5.45		5.65		5.74		6.04	
	949	Cap.	5.69	5.24	7.29	6.71	9.01	8.24	10.2	9.31	10.9	9.79	13.0	11.4	15.6	15.0	17.4	17.4	18.1	18.1	20.5	20.5
		kW	4.34		4.53		4.73		4.86		4.93		5.16		5.43		5.61		5.68		5.90	
	1067	Cap.	5.81	5.35	7.42	6.83	9.13	8.35	10.3	9.41	11.0	9.90	13.1	11.5	15.8	15.1	17.6	17.6	18.3	18.3	20.6	20.6
		kW	4.42		4.60		4.78		4.91		4.98		5.19		5.44		5.61		5.67		5.87	
27	830	Cap.	5.31	4.89	6.92	6.37	8.67	7.93	9.89	9.02	10.5	9.50	12.7	11.1	15.2	14.5	16.9	16.9	17.7	17.7	20.3	20.3
		kW	4.55		4.79		5.03		5.20		5.29		5.57		5.90		6.12		6.22		6.55	
	949	Cap.	5.43	5.00	7.06	6.50	8.80	8.05	10.0	9.14	10.7	9.62	12.8	11.2	15.4	14.7	17.1	17.1	17.9	17.9	20.2	20.2
		kW	4.62		4.85		5.07		5.22		5.30		5.57		5.86		6.07		6.15		6.40	
	1067	Cap.	5.56	5.11	7.18	6.61	8.94	8.17	10.2	9.26	10.8	9.74	12.9	11.3	15.5	14.9	17.3	17.3	18.0	18.0	20.4	20.4
		kW	4.70		4.91		5.12		5.27		5.34		5.59		5.86		6.05		6.12		6.36	

LEGEND

Cap. — Heating Capacity (kW) (Includes Indoor-Fan Motor Heat)
kW — Total Power Input (Includes Compressor Motor Power Input, Outdoor-Fan Motor Input, and Indoor-Fan Motor Input)

NOTES:

1. Shaded cells indicate integrated ratings.
2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

HEATING CAPACITIES — ENGLISH

50HS024

Return Air (F db)	Cfm (Std Air)		Air Temperature Entering Outdoor Coil (F)																	
			−10		0		10		17		20		30		40		47		50		60	
60	700	Cap.	5.21	4.80	7.43	6.84	10.0	9.14	11.8	10.7	12.8	11.6	16.2	14.2	20.7	19.8	23.8	23.8	25.4	25.4	30.8	30.8
		kW	1.78		1.86		1.93		1.98		2.01		2.09		2.18		2.25		2.28		2.38	
	800	Cap.	5.37	4.94	7.62	7.01	10.2	9.34	12.0	11.0	13.1	11.8	16.6	14.5	21.1	20.3	24.3	24.3	25.9	25.9	31.3	31.3
		kW	1.82		1.90		1.97		2.01		2.04		2.11		2.20		2.26		2.29		2.37	
	900	Cap.	5.52	5.08	7.79	7.17	10.4	9.53	12.3	11.2	13.3	12.0	16.9	14.8	21.5	20.6	24.7	24.7	26.3	26.3	31.7	31.7
		kW	1.87		1.94		2.01		2.05		2.07		2.14		2.22		2.28		2.30		2.37	
70	700	Cap.	4.61	4.24	6.80	6.26	9.37	8.57	11.2	10.2	12.2	11.0	15.4	13.5	19.7	18.9	22.7	22.7	24.3	24.3	29.5	29.5
		kW	1.79		1.89		1.97		2.03		2.06		2.15		2.26		2.33		2.37		2.48	
	800	Cap.	4.76	4.37	6.98	6.42	9.58	8.76	11.4	10.4	12.4	11.2	15.8	13.8	20.1	19.3	23.2	23.2	24.8	24.8	30.2	30.2
		kW	1.84		1.93		2.01		2.06		2.09		2.18		2.28		2.34		2.38		2.48	
	900	Cap.	4.90	4.51	7.17	6.59	9.78	8.94	11.6	10.6	12.6	11.4	16.0	14.1	20.5	19.7	23.6	23.6	25.3	25.3	30.7	30.7
		kW	1.89		1.97		2.05		2.10		2.13		2.21		2.30		2.36		2.39		2.48	
80	700	Cap.	3.93	3.61	6.10	5.61	8.67	7.93	10.5	9.55	11.4	10.3	14.6	12.8	18.7	18.7	21.6	21.6	23.1	23.1	28.1	28.1
		kW	1.81		1.91		2.01		2.07		2.11		2.21		2.33		2.41		2.45		2.57	
	800	Cap.	4.07	3.74	6.27	5.77	8.89	8.13	10.7	9.78	11.7	10.5	14.9	13.1	19.2	18.4	22.1	22.1	23.7	23.7	28.8	28.8
		kW	1.85		1.95		2.04		2.11		2.14		2.24		2.35		2.42		2.46		2.57	
	900	Cap.	4.21	3.88	6.46	5.94	9.10	8.32	10.9	9.98	11.9	10.8	15.2	13.3	19.5	18.7	22.5	22.5	24.1	24.1	29.4	29.4
		kW	1.90		2.00		2.08		2.15		2.17		2.27		2.37		2.44		2.47		2.58	

LEGEND

Cap. — Heating Capacity (1000 Btuh) (Includes Indoor-Fan Motor Heat)
kW — Total Power Input (Includes Compressor Motor Power Input, Outdoor-Fan Motor Input, and Indoor-Fan Motor Input)

NOTES:

1. Shaded cells indicate integrated ratings.
2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

Performance data (cont)

HEATING CAPACITIES — ENGLISH (cont)

50HS030

Return Air (F db)	Cfm (Std Air)		Air Temperature Entering Outdoor Coil (F)																			
			−10		0		10		17		20		30		40		47		50		60	
60	875	Cap.	5.65	5.20	8.48	7.81	11.8	10.7	14.0	12.8	15.3	13.8	19.4	17.0	24.7	23.7	28.4	28.4	30.3	30.3	36.6	36.6
		kW	1.92		2.03		2.13		2.21		2.24		2.36		2.49		2.59		2.63		2.78	
	1000	Cap.	5.85	5.38	8.73	8.03	12.0	11.0	14.3	13.1	15.6	14.0	19.8	17.3	25.2	24.2	29.0	29.0	30.9	30.9	37.4	37.4
		kW	1.97		2.07		2.17		2.24		2.28		2.39		2.51		2.60		2.64		2.77	
	1125	Cap.	6.03	5.54	8.94	8.22	12.3	11.2	14.6	13.3	15.9	14.3	20.1	17.6	25.6	24.6	29.5	29.5	31.5	31.5	38.1	38.1
		kW	2.01		2.12		2.22		2.28		2.31		2.42		2.53		2.61		2.65		2.77	
70	875	Cap.	4.68	4.31	7.50	6.90	10.8	9.85	13.1	11.9	14.3	12.9	18.3	16.1	23.4	22.5	27.0	27.0	28.9	28.9	35.0	35.0
		kW	1.93		2.05		2.18		2.26		2.30		2.43		2.58		2.69		2.74		2.90	
	1000	Cap.	4.86	4.47	7.74	7.12	11.1	10.1	13.4	12.2	14.6	13.2	18.7	16.4	23.9	23.0	27.6	27.6	29.5	29.5	35.8	35.8
		kW	1.98		2.10		2.22		2.30		2.34		2.46		2.60		2.70		2.74		2.89	
	1125	Cap.	5.03	4.63	7.96	7.32	11.3	10.4	13.7	12.5	14.9	13.5	19.1	16.7	24.4	23.4	28.1	28.1	30.0	30.0	36.5	36.5
		kW	2.03		2.15		2.26		2.34		2.38		2.50		2.63		2.72		2.76		2.90	
80	875	Cap.	3.57	3.29	6.39	5.88	9.68	8.85	12.0	10.9	13.2	11.9	17.2	15.1	22.2	21.3	25.7	25.7	27.4	27.4	33.4	33.4
		kW	1.94		2.07		2.21		2.31		2.35		2.50		2.67		2.78		2.83		3.01	
	1000	Cap.	3.74	3.44	6.63	6.10	9.97	9.11	12.3	11.2	13.5	12.2	17.6	15.4	22.7	21.8	26.2	26.2	28.1	28.1	34.2	34.2
		kW	1.98		2.12		2.25		2.35		2.39		2.53		2.69		2.80		2.85		3.01	
	1125	Cap.	3.90	3.59	6.85	6.30	10.2	9.34	12.6	11.5	13.8	12.5	18.0	15.7	23.1	22.2	26.7	26.7	28.6	28.6	34.8	34.8
		kW	2.03		2.17		2.30		2.39		2.43		2.56		2.71		2.82		2.86		3.02	

LEGEND

Cap. — Heating Capacity (1000 Btuh) (Includes Indoor-Fan Motor Heat)
kW — Total Power Input (Includes Compressor Motor Power Input, Outdoor-Fan Motor Input, and Indoor-Fan Motor Input)

NOTES:

1. [ ] indicates integrated ratings.
2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

50HS036

Return Air (F db)	Cfm (Std Air)		Air Temperature Entering Outdoor Coil (F)																			
			−10		0		10		17		20		30		40		47		50		60	
60	1050	Cap.	7.56	6.95	10.9	10.0	14.8	13.6	17.6	16.0	19.1	17.2	24.1	21.2	30.6	29.4	35.2	35.2	37.5	37.5	45.4	45.4
		kW	2.23		2.38		2.54		2.64		2.69		2.86		3.06		3.20		3.27		3.50	
	1200	Cap.	7.83	7.20	11.2	10.3	15.2	13.9	18.0	16.4	19.5	17.6	24.7	21.6	31.3	30.0	35.9	35.9	38.3	38.3	46.4	46.4
		kW	2.31		2.46		2.60		2.71		2.75		2.92		3.10		3.23		3.30		3.51	
	1350	Cap.	8.09	7.44	11.5	10.6	15.5	14.2	18.4	16.7	19.9	18.0	25.1	22.0	31.9	30.6	36.6	36.6	39.0	39.0	47.2	47.2
		kW	2.39		2.54		2.68		2.77		2.82		2.98		3.15		3.28		3.34		3.54	
70	1050	Cap.	6.58	6.06	9.89	9.09	13.8	12.6	16.6	15.1	18.1	16.3	23.0	20.2	29.3	28.1	33.6	33.6	35.9	35.9	43.5	43.5
		kW	2.26		2.43		2.60		2.71		2.77		2.96		3.18		3.33		3.40		3.65	
	1200	Cap.	6.86	6.31	10.2	9.39	14.2	13.0	17.0	15.5	18.5	16.7	23.5	20.6	29.9	28.7	34.4	34.4	36.7	36.7	44.5	44.5
		kW	2.34		2.50		2.67		2.78		2.83		3.02		3.22		3.36		3.43		3.66	
	1350	Cap.	7.11	6.54	10.5	9.67	14.5	13.3	17.4	15.8	18.9	17.0	24.0	21.0	30.5	29.3	35.1	35.1	37.4	37.4	45.3	45.3
		kW	2.42		2.58		2.74		2.85		2.90		3.08		3.27		3.41		3.48		3.69	
80	1050	Cap.	5.50	5.06	8.76	8.06	12.7	11.6	15.4	14.1	16.9	15.2	21.8	19.1	27.9	26.8	32.1	32.1	34.4	34.4	41.7	41.7
		kW	2.28		2.46		2.65		2.78		2.84		3.05		3.28		3.45		3.53		3.79	
	1200	Cap.	5.75	5.29	9.08	8.35	13.1	12.0	15.9	14.5	17.4	15.6	22.3	19.5	28.5	27.4	32.9	32.9	35.1	35.1	42.7	42.7
		kW	2.36		2.54		2.72		2.85		2.91		3.11		3.33		3.49		3.56		3.81	
	1350	Cap.	6.00	5.52	9.39	8.64	13.4	12.3	16.3	14.8	17.8	16.0	22.8	20.0	29.1	27.9	33.5	33.5	35.8	35.8	43.5	43.5
		kW	2.44		2.61		2.79		2.92		2.97		3.17		3.38		3.53		3.61		3.84	

LEGEND

Cap. — Heating Capacity (1000 Btuh) (Includes Indoor-Fan Motor Heat)
kW — Total Power Input (Includes Compressor Motor Power Input, Outdoor-Fan Motor Input, and Indoor-Fan Motor Input)

NOTES:

1. [ ] indicates integrated ratings.
2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

HEATING CAPACITIES — ENGLISH (cont)

50HS048

Return Air (F db)	Cfm (Std Air)		Air Temperature Entering Outdoor Coil (F)																			
			−10		0		10		17		20		30		40		47		50		60	
60	1400	Cap.	15.2	14.0	19.8	18.2	24.7	22.6	28.1	25.6	30.0	27.0	36.3	31.8	44.5	42.6	50.1	50.1	52.7	52.7	61.4	61.4
		kW	3.45		3.60		3.69		3.76		3.80		3.93		4.11		4.23		4.29		4.48	
	1600	Cap.	15.6	14.4	20.2	18.5	25.1	22.9	28.5	26.0	30.4	27.4	26.8	32.3	45.1	43.2	50.8	50.8	53.2	53.2	61.2	61.2
		kW	3.53		3.65		3.74		3.80		3.83		3.94		4.11		4.22		4.26		4.48	
	1800	Cap.	16.0	14.7	20.5	18.8	25.4	23.2	28.8	26.3	30.8	27.8	37.3	32.7	45.6	43.7	51.4	51.4	53.7	53.7	61.6	61.6
		kW	3.61		3.72		3.79		3.85		3.88		3.98		4.13		4.24		4.28		4.41	
70	1400	Cap.	13.9	12.7	19.0	17.5	24.1	22.0	27.6	25.2	29.5	26.6	35.7	31.3	43.6	41.8	49.2	49.2	51.8	51.8	60.5	60.5
		kW	3.55		3.82		3.97		4.07		4.12		4.26		4.46		4.59		4.66		4.87	
	1600	Cap.	14.3	13.2	19.5	17.9	24.5	22.4	28.0	25.5	29.9	27.0	36.2	31.7	44.2	42.3	49.8	49.8	52.4	52.4	61.2	61.2
		kW	3.64		3.88		4.01		4.10		4.14		4.27		4.44		4.56		4.62		4.81	
	1800	Cap.	14.7	13.6	19.9	18.3	24.9	22.8	28.4	25.9	30.3	27.3	36.6	32.1	44.7	42.9	50.4	50.4	52.9	52.9	61.1	61.1
		kW	3.73		3.95		4.07		4.14		4.18		4.30		4.46		4.57		4.62		4.77	
80	1400	Cap.	11.8	10.9	17.6	16.2	23.1	21.1	27.0	24.6	28.9	26.0	35.1	30.8	42.9	41.1	48.3	48.3	51.0	51.0	60.1	60.1
		kW	3.55		3.95		4.21		4.39		4.44		4.63		4.85		5.00		5.07		5.33	
	1600	Cap.	12.3	11.3	18.1	16.7	23.6	21.6	27.4	25.0	29.3	26.4	35.6	31.2	43.4	41.6	48.9	48.9	51.5	51.5	60.4	60.4
		kW	3.65		4.03		4.26		4.42		4.47		4.63		4.82		4.95		5.02		5.23	
	1800	Cap.	12.8	11.7	18.6	17.1	24.0	22.0	27.8	25.4	29.7	26.8	36.0	31.6	43.9	42.1	49.5	49.5	52.0	52.0	60.6	60.6
		kW	3.75		4.11		4.32		4.46		4.50		4.65		4.82		4.95		5.00		5.18	

LEGEND

Cap. — Heating Capacity (1000 Btuh) (Includes Indoor-Fan Motor Heat)
kW — Total Power Input (Includes Compressor Motor Power Input, Outdoor-Fan Motor Input, and Indoor-Fan Motor Input)

NOTES:

1. ▭ indicates integrated ratings.
2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

50HS060

Return Air (F db)	Cfm (Std Air)		Air Temperature Entering Outdoor Coil (F)																			
			−10		0		10		17		20		30		40		47		50		60	
60	1750	Cap.	19.7	18.2	25.1	23.1	30.9	28.2	34.9	31.8	37.1	33.5	44.5	39.0	53.4	51.2	59.7	59.7	62.4	62.4	71.4	71.4
		kW	3.99		4.18		4.36		4.48		4.55		4.77		5.03		5.21		5.29		5.55	
	2000	Cap.	20.1	18.5	25.6	23.5	31.3	28.6	35.3	32.2	37.6	33.9	45.0	39.4	54.0	51.7	60.3	60.3	62.7	62.7	70.3	70.3
		kW	4.07		4.24		4.41		4.52		4.58		4.79		5.02		5.18		5.24		5.43	
	2250	Cap.	20.5	18.9	26.0	23.9	31.7	29.0	35.8	32.6	38.0	34.3	45.5	39.9	54.6	52.3	60.9	60.9	63.2	63.2	70.7	70.7
		kW	4.15		4.31		4.47		4.58		4.63		4.82		5.04		5.19		5.24		5.40	
70	1750	Cap.	19.0	17.5	24.4	22.5	30.3	27.7	34.3	31.3	36.5	32.9	43.8	38.4	52.6	50.3	58.7	58.7	61.4	61.4	70.5	70.5
		kW	4.26		4.47		4.68		4.83		4.90		5.16		5.45		5.65		5.74		6.04	
	2000	Cap.	19.4	17.9	24.9	22.9	30.7	28.1	34.8	31.7	37.0	33.4	44.4	38.9	53.3	51.0	59.5	59.5	61.9	61.9	69.8	69.8
		kW	4.34		4.53		4.72		4.86		4.93		5.16		5.43		5.61		5.68		5.90	
	2250	Cap.	19.8	18.2	25.3	23.3	31.1	28.5	35.2	32.1	37.4	33.8	44.8	39.3	53.8	51.5	60.1	60.1	62.5	62.5	70.4	70.4
		kW	4.42		4.60		4.78		4.91		4.97		5.19		5.44		5.61		5.67		5.87	
80	1750	Cap.	18.1	16.7	23.6	21.7	29.6	27.0	33.7	30.7	35.9	32.4	43.3	37.9	51.8	49.6	57.8	57.8	60.4	60.4	69.4	69.4
		kW	4.55		4.79		5.03		5.20		5.29		5.57		5.90		6.12		6.22		6.56	
	2000	Cap.	18.5	17.0	24.1	22.1	30.0	27.4	34.2	31.2	36.4	32.8	43.7	38.3	52.4	50.2	58.5	58.5	60.9	60.9	68.9	68.9
		kW	4.62		4.84		5.07		5.22		5.30		5.57		5.86		6.07		6.15		6.40	
	2250	Cap.	18.9	17.4	24.5	22.5	30.5	27.9	34.6	31.6	36.8	33.2	44.2	38.7	52.9	50.7	59.1	59.1	61.5	61.5	69.5	69.5
		kW	4.70		4.91		5.12		5.27		5.34		5.59		5.86		6.06		6.13		6.36	

LEGEND

Cap. — Heating Capacity (1000 Btuh) (Includes Indoor-Fan Motor Heat)
kW — Total Power Input (Includes Compressor Motor Power Input, Outdoor-Fan Motor Input, and Indoor-Fan Motor Input)

NOTES:

1. ▭ indicates integrated ratings.
2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

Performance data (cont)

DRY COIL AIR DELIVERY*, HORIZONTAL AND VERTICAL DISCHARGE — SI

UNIT 50HS	MOTOR SPEED		220 AND 400 VOLT External Static Pressure (Pa)										
			0	25	50	75	100	125	150	175	200	225	250
024	Low	Watts	522	492	467	429	408	373	320	316	270	—	—
		L/s	726	690	656	599	569	496	458	404	295	—	—
	High	Watts	—	591	562	530	492	474	427	392	349	—	—
		L/s	—	747	702	652	603	558	473	380	287	—	—
030	Low	Watts	—	572	537	490	452	408	368	329	291	—	—
		L/s	—	723	701	656	615	541	485	391	314	—	—
	High	Watts	—	650	597	571	522	487	453	393	361	—	—
		L/s	—	814	766	719	655	599	516	403	317	—	—
036	Low	Watts	—	—	—	557	528	500	477	440	—	—	—
		L/s	—	—	—	717	661	596	544	451	—	—	—
	High	Watts	—	—	—	—	686	656	625	576	—	—	—
		L/s	—	—	—	—	708	634	565	441	—	—	—
048	Low	Watts	—	—	—	—	983	890	770	758	731	667	—
		L/s	—	—	—	—	1000	917	827	807	764	665	—
	High	Watts	—	—	—	—	—	1139	881	851	772	754	—
		L/s	—	—	—	—	—	1024	885	846	722	687	—
060	Low	Watts	—	1116	1046	1009	978	907	839	—	—	—	—
		L/s	—	1212	1161	1105	1064	961	865	—	—	—	—
	High	Watts	—	—	980	934	870	807	717	—	—	—	—
		L/s	—	—	1160	1125	1039	964	836	—	—	—	—

*Air delivery values are based on operating voltage of 220 or 400 v, dry coil, without filter or electric heater.
Deduct wet coil, filter, and electric heater pressure drops to obtain external static pressure available for ducting.

NOTES:
1. Do not operate the unit at a cooling airflow that is less than 165 L/s for each 3.5 kW of rated cooling capacity. Indoor coil frosting may occur at airflows below this point.
2. Dashes indicate portions of table that are beyond the blower motor capacity or are not recommended.

DRY COIL AIR DELIVERY*, HORIZONTAL AND VERTICAL DISCHARGE — ENGLISH

UNIT 50HS	MOTOR SPEED		220 AND 400 VOLT External Static Pressure (in. wg)									
			0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
024	Low	Watts	522	492	467	429	408	373	320	316	270	—	—
		Cfm	1538	1463	1390	1269	1206	1052	971	856	626	—	—
	High	Watts	—	591	562	530	492	474	427	392	349	—	—
		Cfm	—	1583	1487	1381	1277	1183	1002	805	609	—	—
030	Low	Watts	—	572	537	490	452	408	368	329	291	—	—
		Cfm	—	1533	1486	1390	1303	1146	1028	829	666	—	—
	High	Watts	—	650	597	571	522	487	453	393	361	—	—
		Cfm	—	1724	1624	1524	1387	1270	1094	855	672	—	—
036	Low	Watts	—	—	—	557	528	500	477	440	—	—	—
		Cfm	—	—	—	1519	1400	1264	1153	956	—	—	—
	High	Watts	—	—	—	—	686	656	625	576	—	—	—
		Cfm	—	—	—	—	1500	1344	1197	934	—	—	—
048	Low	Watts	—	—	—	—	983	890	770	758	731	667	—
		Cfm	—	—	—	—	2120	1944	1753	1711	1618	1409	—
	High	Watts	—	—	—	—	—	1139	881	851	772	754	—
		Cfm	—	—	—	—	—	2171	1876	1793	1531	1456	—
060	Low	Watts	—	1116	1046	1009	978	907	839	—	—	—	—
		Cfm	—	2568	2461	2341	2254	2036	1834	—	—	—	—
	High	Watts	—	—	980	934	870	807	717	—	—	—	—
		Cfm	—	—	2459	2383	2202	2043	1771	—	—	—	—

*Air delivery values are based on operating voltage of 220 or 400 v, dry coil, without filter or electric heater.
Deduct wet coil, filter, and electric heater pressure drops to obtain external static pressure available for ducting.

NOTES:
1. Do not operate the unit at a cooling airflow that is less than 350 cfm for each 12,000 Btuh of rated cooling capacity. Indoor coil frosting may occur at airflows below this point.
2. Dashes indicate portions of table that are beyond the blower motor capacity or are not recommended.

WET COIL PRESSURE DROP — SI

UNIT 50HS	AIRFLOW (L/s)	PRESSURE DROP (Pa)
024	283	10
	330	14
	378	19
	425	22
030	425	22
	472	24
	566	31
036	472	17
	569	22
	661	27
	755	31
048	661	17
	755	19
	850	22
060	802	20
	896	24
	991	27
	1085	31

WET COIL PRESSURE DROP — ENGLISH

UNIT 50HS	AIRFLOW (cfm)	PRESSURE DROP (in. wg)
024	600	0.039
	700	0.058
	800	0.075
	900	0.088
030	900	0.088
	1000	0.095
	1200	0.123
036	1000	0.068
	1200	0.088
	1400	0.108
	1600	0.123
048	1400	0.068
	1600	0.075
	1800	0.088
060	1700	0.082
	1900	0.095
	2100	0.108
	2300	0.123

ACCESSORY ELECTRIC HEAT PRESSURE DROP (Pa) — SI

HEATER kW	L/s								
	283	378	472	569	661	755	850	941	1038
6.9-14.7	7.5	8.2	9.2	10.4	11.7	12.9	14.9	16.7	18.7

NOTE: Direct interpolation is permissible. Do not extrapolate.

ACCESSORY ELECTRIC HEAT PRESSURE DROP (in. wg) — ENGLISH

HEATER kW	CFM								
	600	800	1000	1200	1400	1600	1800	1995	2200
6.9-14.7	0.030	0.033	0.037	0.042	0.047	0.052	0.060	0.067	0.075

NOTE: Direct interpolation is permissible. Do not extrapolate.

FILTER PRESSURE DROP (Pa) — SI

UNIT 50HS	FILTER SIZE (mm)	L/s																			
		236	283	330	378	425	472	519	569	614	661	707	755	802	850	896	941	991	1038	1085
024	508 x 508	12.4	17.4	19.9	24.9	29.9	32.3	—	—	—	—	—	—	—	—	—	—	—	—	—
030	508 x 610	—	—	—	—	22.4	24.9	27.4	32.3	34.8	—	—	—	—	—	—	—	—	—	—
036	610 x 610	—	—	—	—	—	19.9	22.4	24.9	27.4	29.9	34.8	37.3	—	—	—	—	—	—	—
048,060	610 x 772	—	—	—	—	—	—	—	—	—	22.4	24.9	27.4	29.9	32.3	34.8	37.3	39.8	42.3	44.8

FILTER PRESSURE DROP (in. wg) — ENGLISH

UNIT 50HS	FILTER SIZE (in.)	Cfm																		
		500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	1995	2100	2200	2300
024	20 x 20	0.05	0.07	0.08	0.10	0.12	0.13	—	—	—	—	—	—	—	—	—	—	—	—	—
030	20 x 24	—	—	—	—	0.09	0.10	0.11	0.13	0.14	—	—	—	—	—	—	—	—	—	—
036	24 x 24	—	—	—	—	—	0.08	0.09	0.10	0.11	0.12	0.14	0.15	—	—	—	—	—	—	—
048,060	24 x 30	—	—	—	—	—	—	—	—	—	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18

Performance data (cont)

ACCESSORY ELECTRIC HEATER PACKAGE USAGE — DUAL-POINT POWER CONNECTIONS

ELECTRIC HEATER ACCESSORY KIT	KIT PART NUMBER 50SS900	UNIT SIZE				
		024	030	036	048	060
		220-3-50				
8.4	007	X	X	X	X	—
		400-3-50				
6.9	010	X	X	X	X	X
10.4	011	X	X	X	X	X
12.1	012	—	—	—	X	X

ACCESSORY ELECTRIC HEATER PACKAGES — 220 V, 3-PHASE — SINGLE-POINT CONNECTION

UNIT 50 HS	ELECTRIC HEAT/ SINGLE POINT WIRING KIT 50SS900	ELECTRIC HEAT (kW) 220 V, 3 Ph	HEATER FLA	MIN CIRCUIT AMPACITY FOR WIRE SIZING	MAX FUSE OR HACR BRKR	MOCP
024	007	8.4	23.2	46.7	50	—
030	007	8.4	23.2	48.5	30	—
036	007 083	8.4 12.6	23.2 34.8	51.7 66.2	60 —	— 70
048	007 083 084	8.4 12.6 14.7	23.2 34.8 40.5	64.2 78.7 85.9	— — —	70 80 90
060	082 083 084	8.4 12.6 14.7	23.2 34.8 40.5	59.7 74.2 81.4	60 — —	— 80 90

ACCESSORY ELECTRIC HEATER PACKAGES — 400 V, 3-PHASE — SINGLE-POINT CONNECTION

UNIT 50 HS	ELECTRIC HEAT/ SINGLE POINT WIRING KIT 50SS900	ELECTRIC HEAT (kW) 400 V, 3 Ph	HEATER FLA	MIN CIRCUIT AMPACITY FOR WIRE SIZING	MAX FUSE OR HACR BRKR
024	010 011	6.9 10.4	10.5 15.8	22.1 28.7	25 30
030	010 011	6.9 10.4	10.5 15.8	22.1 28.7	25 30
036	010 011	6.9 10.4	10.5 15.8	24.1 30.7	25 35
048	010 011 012	6.9 10.4 12.1	10.5 15.8 18.5	31.6 38.3 41.6	35 40 45
060	010 011 012	6.9 10.4 12.1	10.5 15.8 18.5	31.0 37.6 41.0	35 40 45

LEGEND

BRKR — Breaker
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
MOCP — Maximum Overcurrent Protection (fuse or HACR-type circuit breaker)
NEC — National Electrical Code (U.S.A. Standard)

NOTE: In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker.

MULTIPLICATION FACTORS

HEATER kW RATING	VOLTAGE DISTRIBUTION V/3/50	MULTIPLICATION FACTOR
220	200 220 230 240	.83 1.00 1.09 1.19
400	380 400 415	.90 1.00 1.08

Example: 12.6 kW (at 220 v) heater on 200 v
= 12.6 (.83 mult factor)
= 10.5 kW capacity at 200 v

NOTE: Heater kW rating is voltage as marked on 50HS base unit nameplate. Voltage distribution is the design power supply at installation site.

MINIMUM AIRFLOW FOR SAFE ELECTRIC HEATER OPERATION - SI

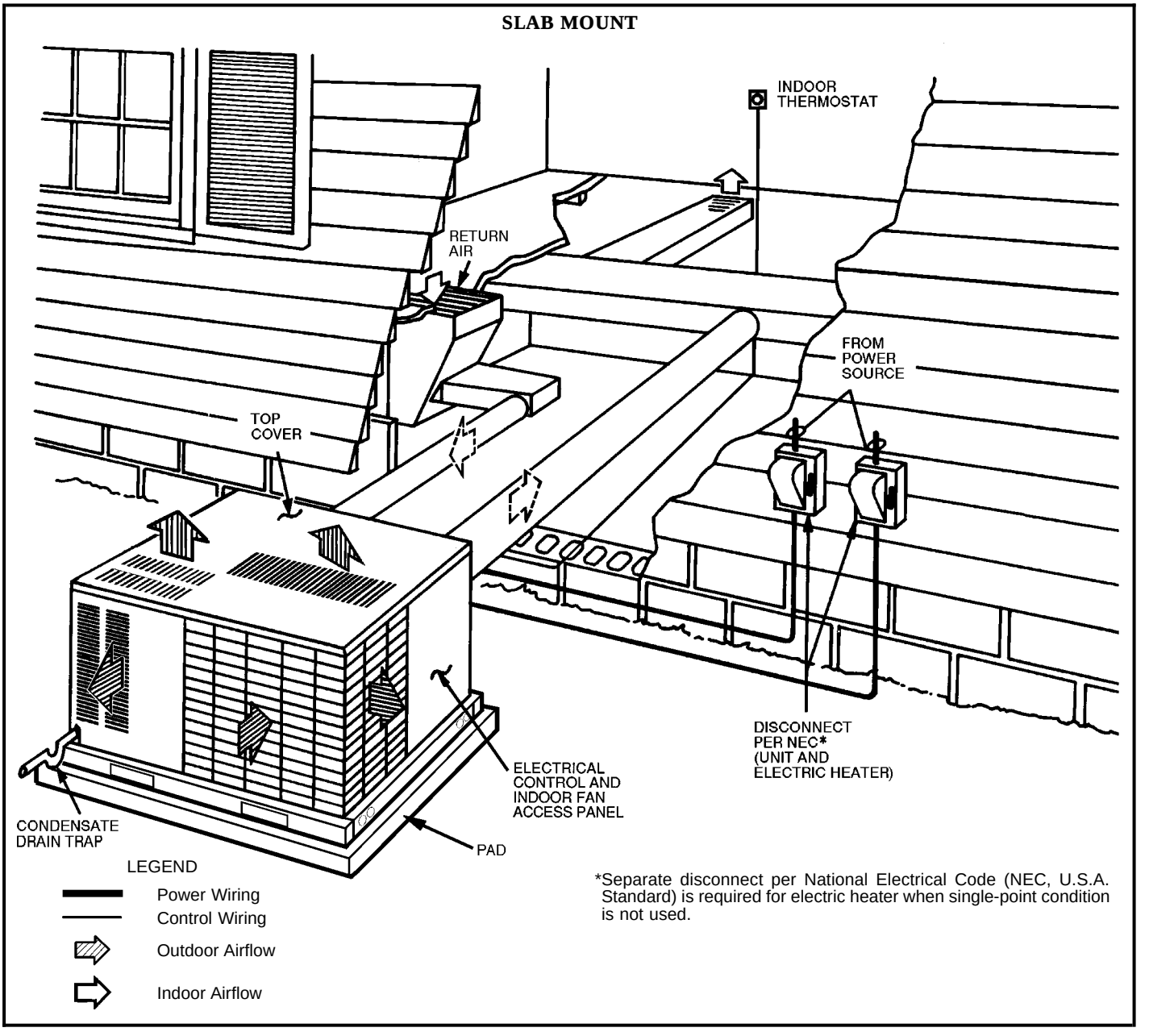
MINIMUM AIRFLOW (L/s)				
Unit Size 50HS				
024	**030**	**036**	**048**	**060**
330	413	567	661	826

MINIMUM AIRFLOW FOR SAFE ELECTRIC HEATER OPERATION - ENGLISH

MINIMUM AIRFLOW (Cfm)				
Unit Size 50HS				
024	**030**	**036**	**048**	**060**
700	875	1200	1400	1750

Typical piping and wiring

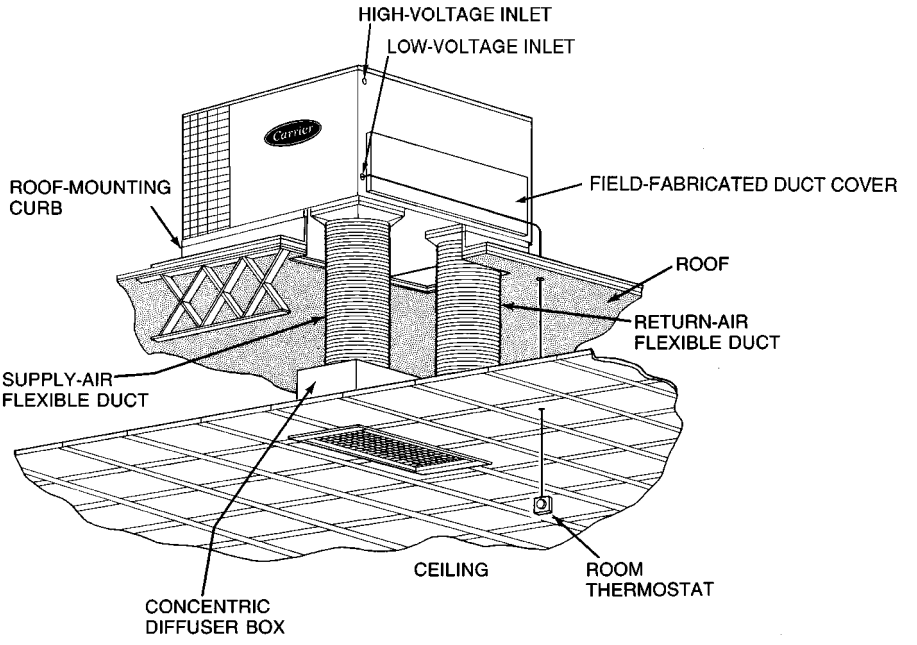
SLAB MOUNT



*Separate disconnect per National Electrical Code (NEC, U.S.A. Standard) is required for electric heater when single-point condition is not used.

Typical piping and wiring (cont)

CURB MOUNT



Controls

Sequence of operation

Indoor fan — With the thermostat fan switch in the ON position, 24 v is supplied to the indoor-fan relay (IFR) through G on the thermostat. This voltage energizes the coil of the relay, closes the normally open set of contacts, and provides continuous power to the indoor-fan motor (IFM). If the switch is moved to the AUTO. position, the fan will cycle with the compressor.

Cooling — When power is supplied to the unit, transformer (TRAN) is energized. On units with a reciprocating compressor, crankcase heater (CH) is also energized.

On a call for cooling and with indoor fan set at AUTO. position, the thermostat makes circuits R-Y, R-G, and R-O. When room temperature rises, the thermostat makes circuits R to Y to contactor (C). After a 5-minute delay, the outdoor-fan motor (OFM) and compressor start. Circuit R-O energizes the reversing valve (RVS). Circuit R-G makes and energizes IFR starting the IFM. When the thermostat is satisfied, contacts open, deenergizing the contactor. The compressor and IFM stop. The IFR has a 30-second delay before deenergizing the indoor blower motor.

Heating — On a call for heating, the thermostat makes circuits R-Y and R-G. When room temperature falls, the thermostat makes circuits to R to Y to contactor (C). After a 5-minute delay, the OFM and compressor start. Circuit R-G makes and energizes the IFR, starting the IFM. If room temperature continues to fall, circuit R-W makes through the second-stage thermostat bulb. If an accessory electric heat package is used, a relay is energized bringing on electric heat. When the thermostat is satisfied, contacts open, deenergizing the contactor and relay. Motors and heaters stop. The IFM can be controlled by a time-delay relay which causes the fan to delay for 30 seconds.

Defrost — The defrost board (DB) is a time and temperature control. The DB includes a field-selectable time period between checks for frost (30, 50, or 90 minutes). The electronic timer and defrost cycle start only when the contactor is energized and defrost thermostat (DFT) is closed. The Defrost mode is identical to the Cooling mode, except in Defrost mode, the OFM stops and the accessory electric heat is energized to warm the air supplying the conditioned space.

Electrical data

220/400 V, 3 PHASE

UNIT 50HS	V-PH (50 Hz)	VOLTAGE RANGE		COMPRESSOR		OFM FLA	IFM FLA	ELECTRIC HEAT		POWER SUPPLY	
		Min	Max	RLA	LRA			Nominal kW*	FLA	MCA	MOCP†
024	220-3	198	242	10.0	68	2.4	2.8	— 8.4	— 23.2	17.7 46.7	25 50
	400-3	360	440	4.8	34	1.4	1.6	— 6.9 10.4	— 10.5 15.8	9.0 22.1 28.7	10 25 30
030	220-3	198	242	11.4	75	2.4	2.8	— 8.4	— 23.2	19.5 48.5	30 50
	400-3	360	440	4.8	40	1.4	1.6	— 6.9 10.4	— 10.5 15.8	9.0 22.1 28.7	10 25 30
036	220-3	198	242	14.0	91	2.4	2.8	— 8.4 12.6	— 23.2 34.8	22.7 51.7 66.2	35 60 70
	400-3	360	440	6.4	42	1.4	1.6	— 6.9 10.4	— 10.5 15.8	11.0 24.1 30.7	15 25 35
048	220-3	198	242	19.3	135	3.8	7.3	— 8.4 12.6 14.7	— 23.2 34.8 40.5	35.2 64.2 78.7 85.9	50 70 80 90
	400-3	360	440	10.0	64	2.0	4.0	— 6.9 10.4 12.1	— 10.5 15.8 18.5	18.5 31.6 38.3 41.6	25 35 40 45
060	220-3	198	242	15.7	121	3.8	7.3	— 8.4 12.6 14.7	— 23.2 34.8 40.5	30.7 59.7 74.2 81.4	45 60 80 90
	400-3	360	440	9.5	73	2.0	4.0	— 6.9 10.4 12.1	— 10.5 15.8 18.5	17.9 31.0 37.6 41.0	25 35 40 45

LEGEND

— — No Electric Heat
AWG — American Wire Gage
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refigeration
IFM — Indoor-Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
OFM — Outdoor-Fan Motor
RLA — Rated Load Amps

*Electric heat capacity (kW) is based on heater voltages of 220 v and 400 v. If power distribution voltage to units varies from rated heater voltage, see Multiplication Factors table, page 21.
†Fuse or HACR circuit breaker.

NOTES:

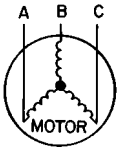
1. The AWG wire size and length is as follows:

UNIT 50HS	AWG 60 C MIN WIRE	MAX WIRE LENGTH	
		M	Ft
220 V, 3 Phase			
024	12	19.8	65
030	12	18.2	60
036	10	25.9	85
048	8	24.4	80
060	8	28.9	95
400 V, 3 Phase			
024-036	14	30.5	100
048,060	12	30.5	100

2. **Unbalanced 3-Phase Supply Voltage**
Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 400-3-50



AB = 393 v
BC = 403 v
AC = 396 v

$$\text{Average Voltage} = \frac{393 + 403 + 396}{3} = \frac{1192}{3} = 397$$

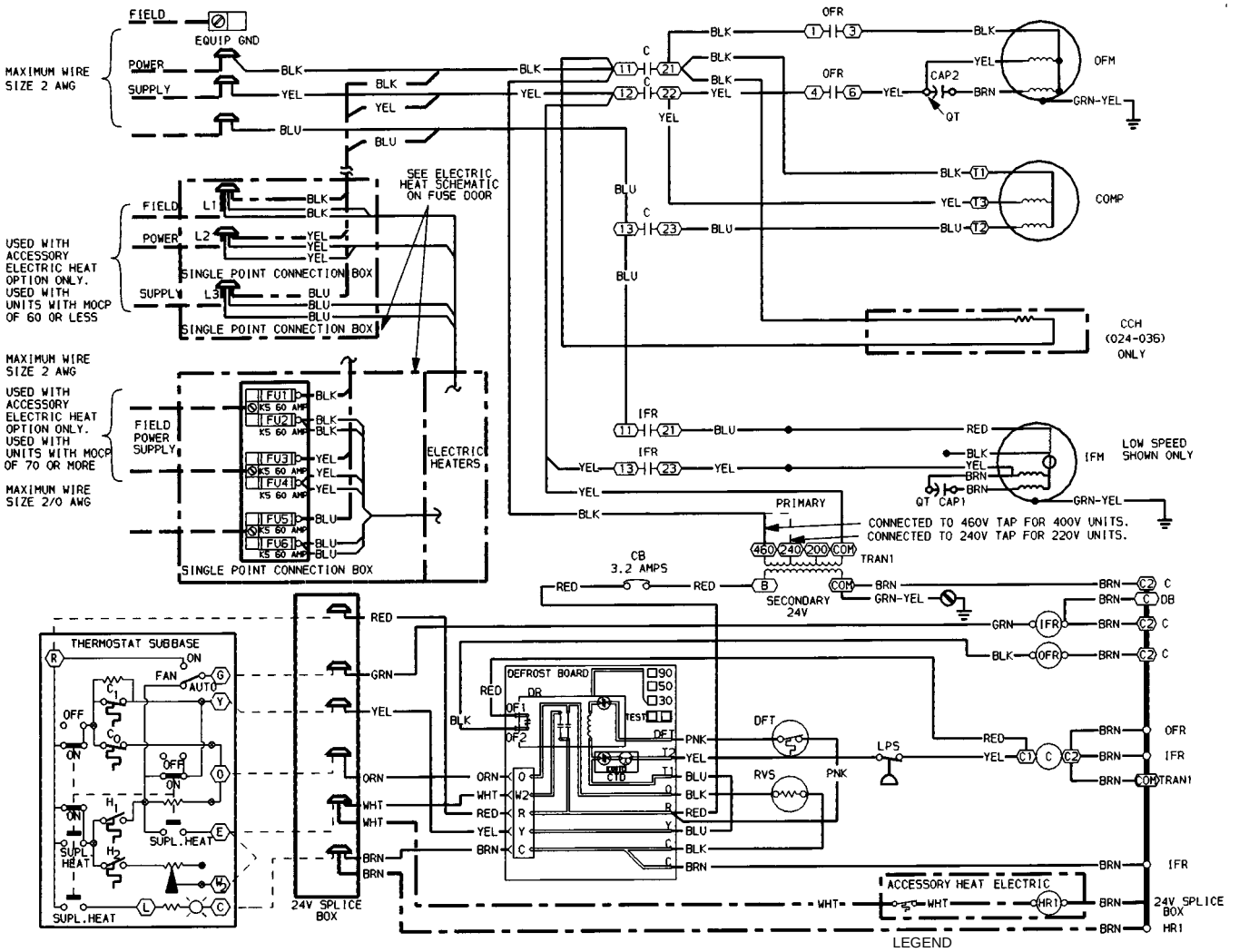
Determine maximum deviation from average voltage.
(AB) 397 − 393 = 4 v
(BC) 403 − 397 = 6 v
(AC) 397 − 396 = 1 v
Maximum deviation is 6 v.
Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{6}{397} = 1.5\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

Typical control wiring schematic (sizes 024-048)



LEGEND

AWG	—	American Wire Gage
C	—	Contactor, Compressor
CAP	—	Capacitor
CB	—	Circuit Breaker
CCH	—	Crankcase Heater
COMP	—	Compressor Motor
CTD	—	Compressor Time Delay
DB	—	Defrost Board
DFT	—	Defrost Thermostat
DR	—	Defrost Relay
EQUIP	—	Equipment
FU	—	Fuse
GND	—	Ground
HR	—	Heater Relay (Strip Heat)
IFM	—	Indoor-Fan Motor
IFR	—	Indoor-Fan Relay
LPS	—	Low-Pressure Switch
MOCP	—	Maximum Overcurrent Protection
NEC	—	National Electrical Code (U.S.A. Standard)
OF	—	Outdoor Fan
OFM	—	Outdoor-Fan Motor
OFR	—	Outdoor-Fan Relay
QT	—	Quadruple Terminal
RVS	—	Reversing Valve Solenoid
SUPL	—	Supplemental
TRAN	—	Transformer

Field Splice

Terminal (Marked)

Terminal (Unmarked)

Splice

Factory Wiring

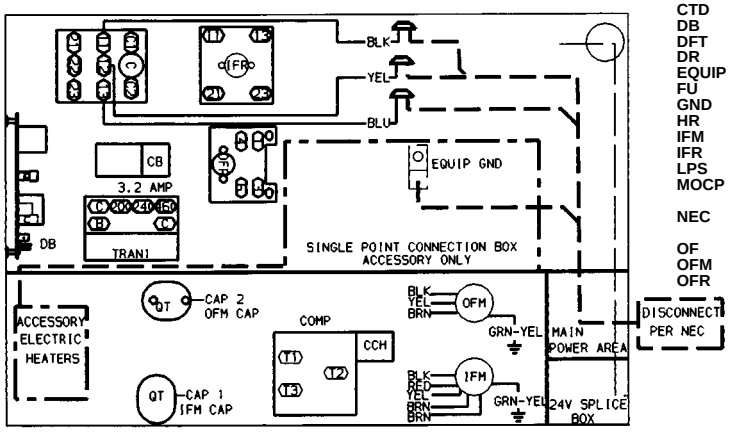
Field Control Wiring

Field Power Wiring

Accessory or Optional Wiring

To indicate common potential only; not to represent wiring

COMPONENT ARRANGEMENT



NOTES:
1. If any of the original wire furnished must be replaced, it must be replaced with type 90 C or its equivalent.
2. Thermostat: HH07AT171
   Subbase: HH93AZ188
3. Set heat anticipator at .42.
4. Use copper conductors only.

Packaged Rooftop Air-to-Air Heat Pump Constant Volume Application

HVAC Guide Specifications

Size Range: **7 to 18 kW (2 to 5 Tons), Nominal (Cooling)**
24,000 to 60,000 Btuh, Nominal (Heating)

Carrier Model Number: **50HS**

Part 1 — General

1.01 SYSTEM DESCRIPTION

Outdoor package, electrically controlled, air-to-air heat pump utilizing a reciprocating or scroll compressor for heating and cooling duty. Unit shall discharge supply air horizontally or downward as shown on contract drawings.

1.02 QUALITY ASSURANCE

A. Unit shall be tested in accordance with ARI Standards 210, 240, and 270 (U.S.A. Standards). Designed in accordance with UL Standard 1995 (U.S.A. Standard).

B. Unit shall be designed to conform to ASHRAE 15 (U.S.A. Standard).

C. Unit shall be manufactured in a facility registered to ISO 9002 (International Standards Organization) manufacturing quality standard.

D. Insulation and adhesive shall meet NFPA 90A (U.S.A. Standard) requirements for flame spread and smoke generation.

1.03 DELIVERY, STORAGE, AND HANDLING

Unit shall be stored and handled per manufacturer's recommendations.

Part 2 — Products

2.01 EQUIPMENT

A. General:

Factory-assembled, single-piece, air-to-air heat pump. Contained within the unit enclosure shall be all factory wiring, piping, controls, and refrigerant charge (R-22).

B. Unit Cabinet:

1. Unit cabinet shall be constructed of phosphated, bonderized, zinc-coated, prepainted steel.
2. Indoor compartment cabinet surfaces shall be insulated with a minimum 12.7 mm (½ in.) thick, flexible fiberglass insulation, coated on the air side, with aluminum foil-faced fiberglass insulation.
3. Cabinet panels shall be easily removable for servicing.
4. Unit shall have a factory-installed sloped, noncorrosive condensate drain.
5. Each unit shall be equipped with a standard, commercial grade base rail. The rails provide holes for rigging as well as an elevated base for horizontal applications.
6. Unit insulation conforms to ASHRAE standard 62P.

C. Fans:

1. Indoor Blower (Indoor Fan):
   a. Fan shall be 2-speed, direct drive as shown on the equipment drawings.
   b. Fan wheel shall be made from steel, be double-inlet type with forward-curved blades with a corrosion-resistant finish, and shall be dynamically balanced.
2. Outdoor fan shall be of the direct-driven propeller type with aluminum blades, riveted to corrosion-resistant steel spiders, shall be dynamically balanced, and shall discharge air upwards and horizontally.

D. Compressor:

1. Fully hermetic type with internal and external vibration isolation. Scroll compressors shall be found on 4- and 5-ton sizes.
2. Equipped with factory-installed crankcase heater to prevent refrigerant dilution (reciprocating only).

E. Coils:

1. Indoor and outdoor coils shall have aluminum-plate fins mechanically bonded to seamless copper tubes with all joints brazed.
2. Tube sheet openings shall be belled to prevent tube wear.

F. Refrigerant Components:

1. Acutrol™ feed system
2. Accumulator (sizes 024-036 only)

G. Filter Section:

Filter section shall accommodate field-installed, throwaway 25-mm (1-in.) thick, return-air filters.

H. Controls and Safeties:

1. Unit Controls:
   a. Unit shall be complete with self-contained low-voltage control circuit.
   b. Unit shall incorporate an outdoor-coil defrost system to prevent excessive frost accumulation during heating duty, and shall be controlled as follows:
      1) Defrost shall be initiated on the basis of time and coil temperature.
      2) A 30/50/90 minute timer shall activate defrost cycle only if coil temperature is low enough to indicate a heavy frost condition.
      3) Defrost cycle shall terminate when defrost thermostat is satisfied or shall have a positive termination time of 10 minutes.
2. Safeties:
   a. Compressor: high pressure, overtemperature, overcurrent.
   b. Loss of charge switch shall be standard.

Guide specifications (cont)

I. Operating Characteristics:

1. Unit shall be capable of starting and running at 46 C (115 F) ambient outdoor temperature per maximum load criteria of ARI Standard 240 (U.S.A. Standard).
2. Compressor with standard controls shall be capable of operation down to 4.4 C (40 F) ambient outdoor temperature in cooling duty.
3. Compressor shall be capable of operation in heating duty down to −29 C (−20 F) ambient outdoor-air temperature.
4. Unit shall be capable of simultaneous heating duty and defrost cycle operation when using electric heaters indicated in Section L, Special Features.
5. Compressors will be prevented from restarting for a minimum of 5 minutes after shutdown.

J. Electrical Requirements:

All unit power wiring shall enter unit cabinet at a single location.

K. Motors:

1. Compressor motors shall be of the refrigerant-cooled type with line break thermal and current overload protection.
2. All fan motors shall have permanently lubricated bearings and inherent automatic-reset thermal overload protection.
3. Outdoor-fan motor shall be totally enclosed.

L. Special Features:

1. Electric Resistance Heaters:
   a. Open-wire nichrome elements with all necessary safety and operating controls.
   b. Heaters are UL (U.S.A. Standard) listed as indicated on basic unit informative plate.
   c. Each heater assembly shall include the following safety features:
      1) Automatic-reset switches.
      2) Heat limiters for primary and secondary, overcurrent, and thermal protection.
   d. Electric heater packages must provide single-point power connection capability.
2. Outdoor Thermostat Kit:

   Thermostat allows for staging of electric heaters based on outdoor-air temperature.
3. Thermostat and Subbase:

   Provides staged cooling and heating automatic (or manual) changeover, and fan control.
4. Electronic Programmable Thermostat:

   Thermostat provides 2-stage heating and 2-stage cooling control with remote communication ability.
5. Controls Upgrade Kit:

   High- and low-pressure switches protect the compressor against improper refrigerant pressures.
6. Low-Ambient Kit:

   Permits cooling operation at outdoor temperatures as low as −18 C (0° F).
7. Roof Curb:

   Provides one-piece support for downflow discharge applications. Constructed of heavy gage, galvanized steel and includes wood nailing strip.
8. 30% Manual Outdoor Damper:

   Provides for minimum outdoor air and is manually adjustable.
9. One-in. Filter Rack:

   Provides internal filtering performance.
10. Duct Cover Kit:

    Covers horizontal ducts when unit is converted to downflow discharge.
11. Rectangular Duct Connection Kit:

    Allows easy conversion from round to rectangular ducts.
12. Downflow Option:

    Provides for easy vertical ductwork connections.

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.